SERVICE MANUAL

FISHER

FM-2321

AM/FM
Stereo Tuner
(EUROPE)

FISHER
FM 100.2 MHz

FISHER
AM/FM STEREO TUNER
POWER
FM 100.2 MHz
FM MUTING
ON
OFF
TUNING
FM-2321

The first name in high fidelity

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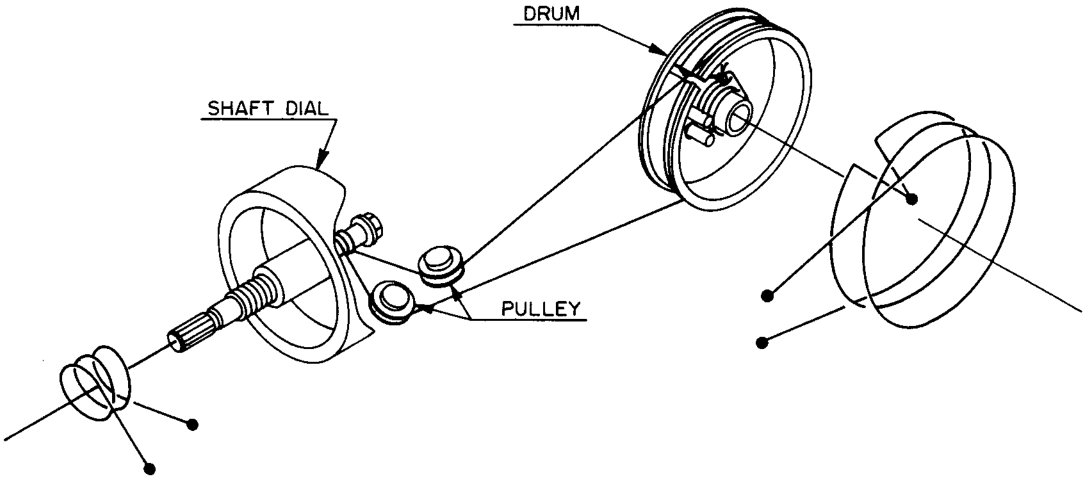
DIAL CORD STRINGING



NOTE: Check to see that the dial cord is correctly strung by turning the dial.

SPECIFICATIONS

AM/FM STEREO TUNER		FM-2321
FM SECTION		
Usable Sensitivity	Mono	1.9 µV/10.8 dBf
	Stereo	4.6 µV/18.5 dBf
50 dB Quieting Sensitivity	Mono	2.8 µV/14.2 dBf
	Stereo	38 µV/36.8 dBf
Signal-to-Noise Ratio	Mono	75 dB
	Stereo	70 dB
Capture Ratio		0.8 dB
Alt. Channel Selectivity (±400 kHz)		80 dB
Image Response Ratio		55 dB
Spurious Response Ratio		85 dB
IF Response Ratio		100 dB
AM Suppression Ratio		65 dB
Total Harmonic Distortion at 50 dB Quieting		
	Mono	0.3 %
	Stereo	0.4 %
Total Harmonic Distortion at 65 dBf		
	Mono (100 Hz/1 kHz/6 kHz)	0.12/0.1/0.2 %
	Stereo (100 Hz/1 kHz/6 kHz)	0.2/0.2/0.3 %
Stereo Separation (100 Hz/1 kHz/10 kHz)		40/46/36 dB
Sub-Carrier Rejection (19 kHz/38 kHz)		60/75 dB
Audio Frequency Response		20 Hz - 15 kHz (±1.0 dB)
AM SECTION		
Usable Sensitivity		280 µV/m
Selectivity		45 dB
Signal-to-Noise Ratio		55 dB
Image Response Ratio		50 dB
IF Response Ratio		45 dB
GENERAL		
Power Requirements		AC: 110/220 V 12 W
Dimensions (W x D x H)		440 x 320 x 89.5 mm
Weight		5.4 kg

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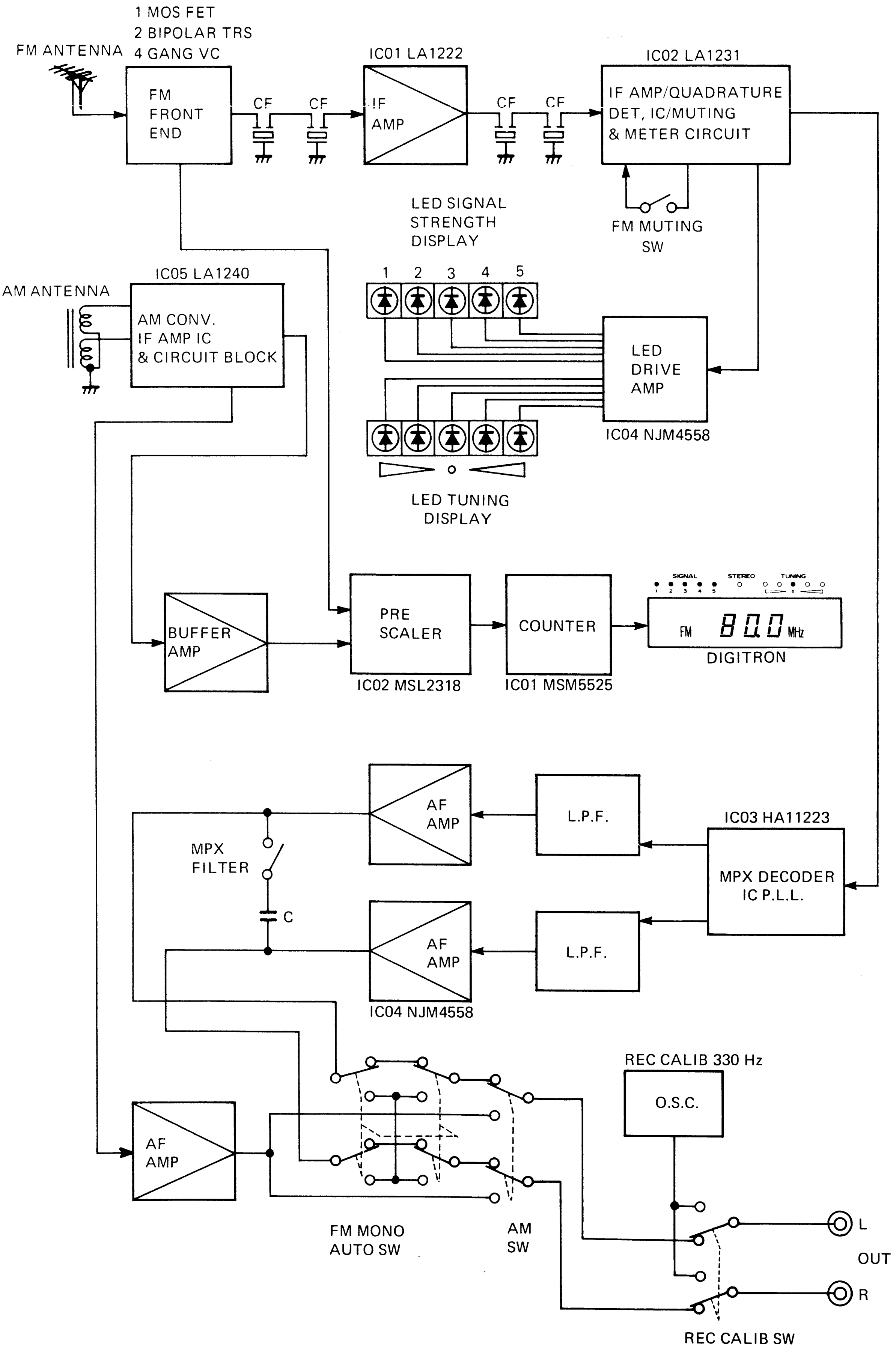
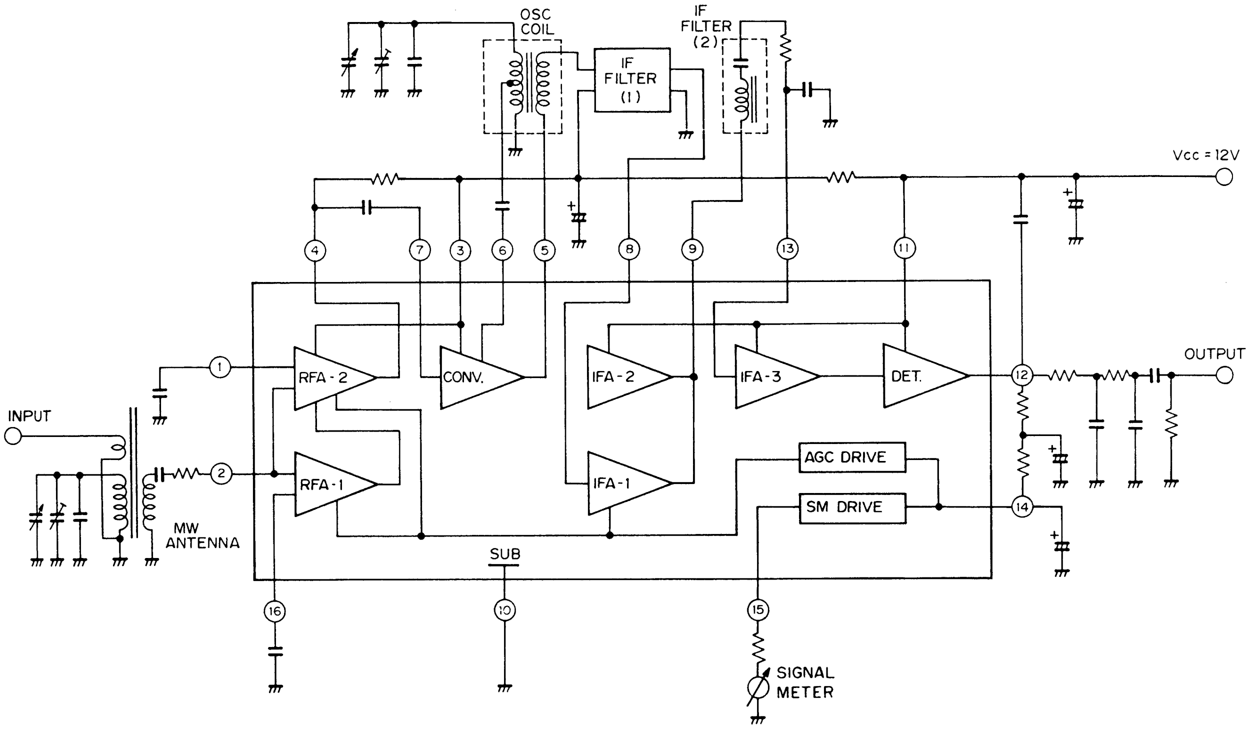
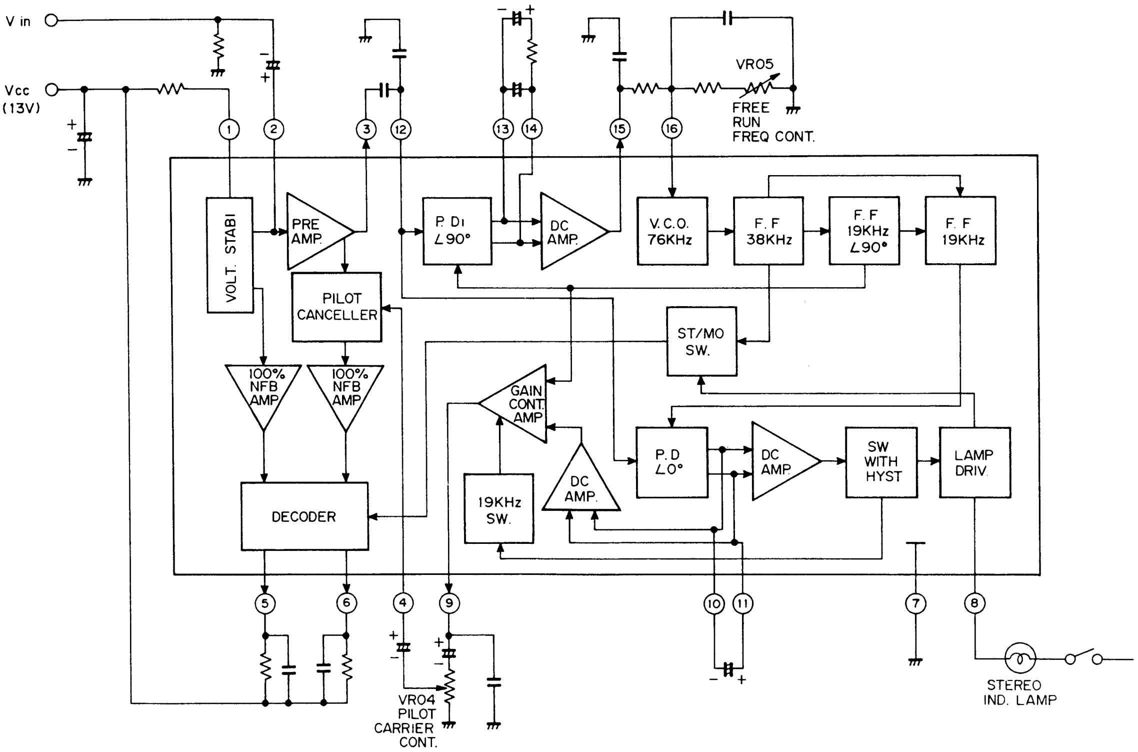
FUNCTIONAL BLOCK DIAGRAM


1 MOS FET
2 BIPOLAR TRS
4 GANG VC
FM ANTENNA
FM FRONT END
CF
CF
IC01 LA1222
IF AMP
CF
CF
IC02 LA1231
IF AMP/QUADRATURE DET, IC/MUTING & METER CIRCUIT
FM MUTING SW
LED SIGNAL STRENGTH DISPLAY
1 2 3 4 5
AM ANTENNA
IC05 LA1240
AM CONV. IF AMP IC & CIRCUIT BLOCK
LED DRIVE AMP
IC04 NJM4558
LED TUNING DISPLAY
BUFFER AMP
PRE SCALER
IC02 MSL2318
COUNTER
IC01 MSM5525
SIGNAL
STEREO
TUNING
FM 80.0 MHz
DIGITRON
AF AMP
L.P.F.
IC03 HA11223
MPX DECODER IC P.L.L.
MPX FILTER
C
AF AMP
L.P.F.
IC04 NJM4558
AF AMP
REC CALIB 330 Hz
O.S.C.
FM MONO AUTO SW
AM SW
L
OUT
R
REC CALIB SW

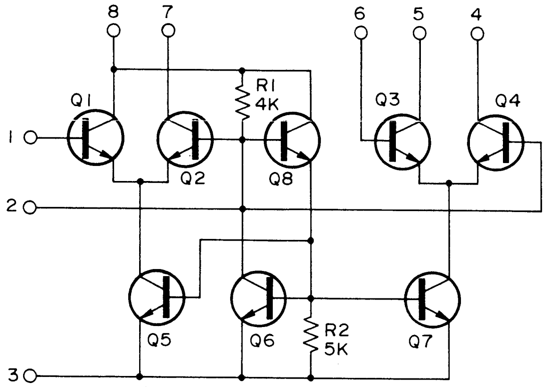
AM RF IF IC LA1240 SIGNAL FLOW


OSC COIL
IF FILTER (1)
IF FILTER (2)
Vcc = 12V
4
7
3
6
5
8
9
13
11
RFA - 2
CONV.
IFA - 2
IFA - 3
DET.
OUTPUT
12
INPUT
1
2
RFA - 1
IFA - 1
AGC DRIVE
SM DRIVE
14
MW ANTENNA
SUB
16
10
15
SIGNAL METER

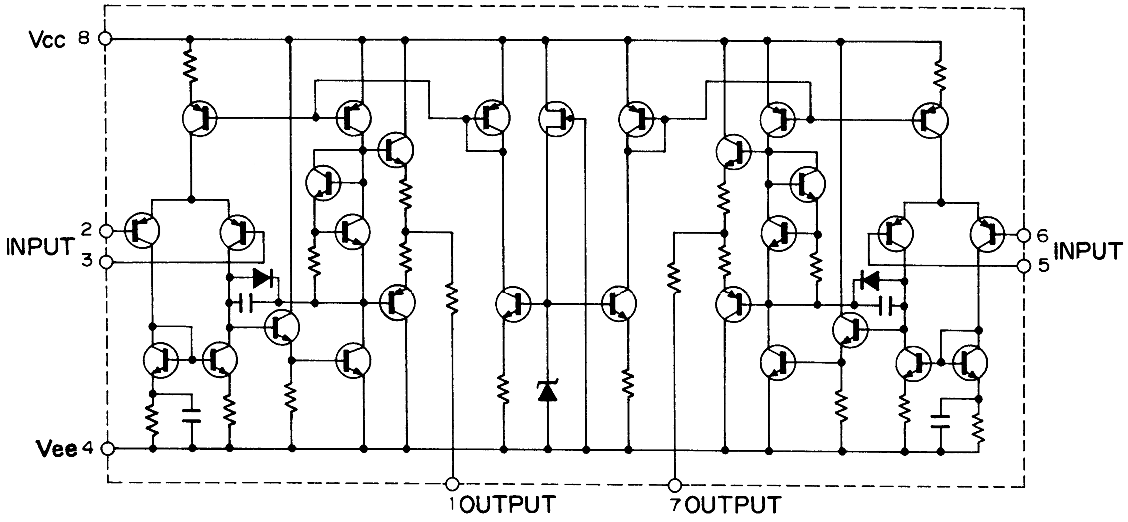
FM MPX IC HA11223 SIGNAL FLOW


V in
Vcc (13V)
1
2
3
12
13
14
15
16
VR05
FREE RUN FREQ CONT.
VOLT. STABI
PRE AMP.
P. D1 ∠90°
DC AMP.
V.C.O. 76KHz
F. F 38KHz
F. F 19KHz ∠90°
F. F 19KHz
PILOT CANCELLER
ST/MO SW.
100% NFB AMP
100% NFB AMP
GAIN CONT. AMP
P. D ∠0°
DC AMP.
SW WITH HYST
LAMP DRIV.
DC AMP.
19KHz SW.
DECODER
5
6
4
9
10
11
7
8
VR04 PILOT CARRIER CONT.
STEREO IND. LAMP

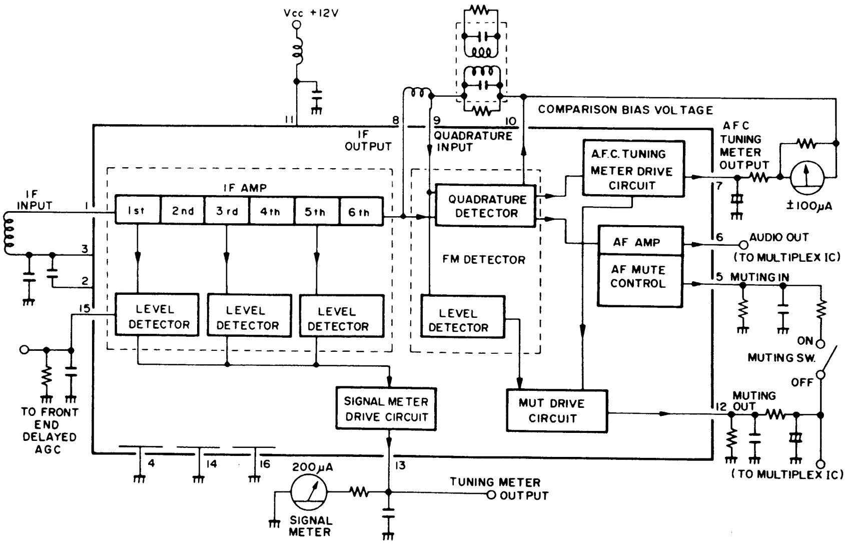
FM IF IC LA1222 EQUIVALENT CIRCUIT


8
7
6
5
4
R1
4K
Q1
Q3
Q4
1
Q2
Q8
2
Q5
Q6
R2
5K
Q7
3

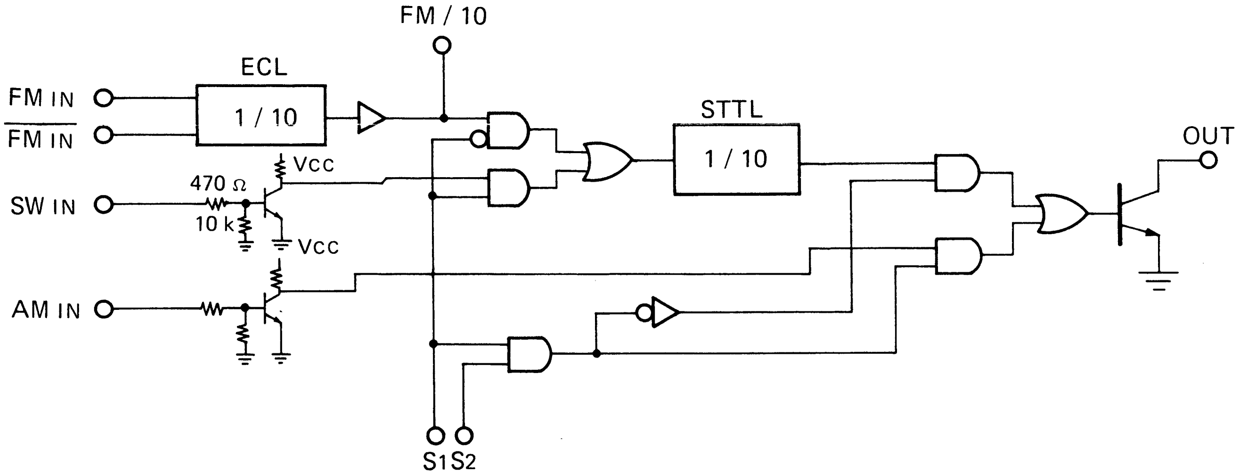
AF AMP NJM4558 EQUIVALENT CIRCUIT


Vcc 8
INPUT 2
3
Vee 4
6
INPUT
5
1 OUTPUT
7 OUTPUT

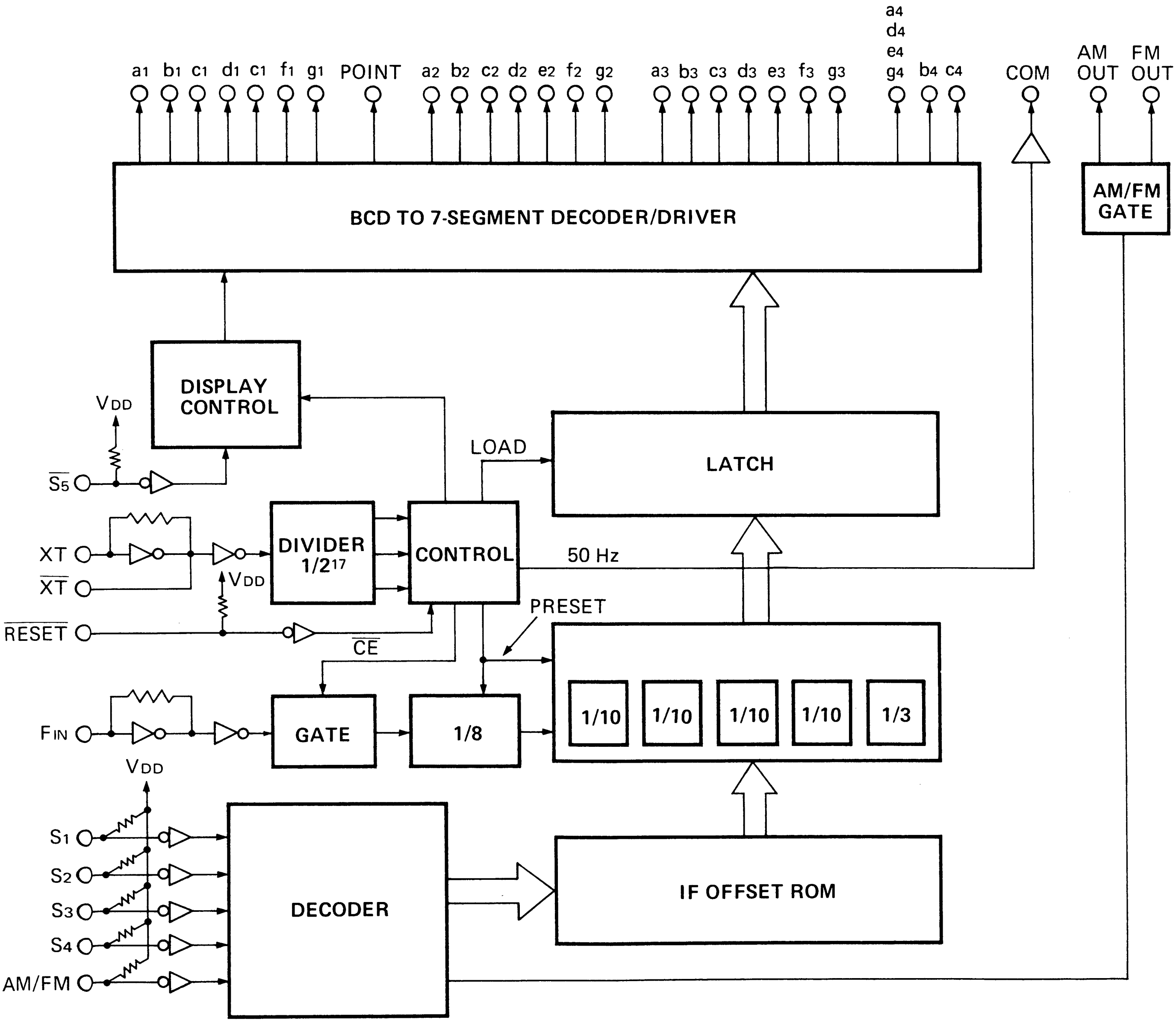
FM IF IC LA1231 SIGNAL FLOW


Vcc +12V
11
8
IF OUTPUT
9
10
QUADRATURE INPUT
COMPARISON BIAS VOLTAGE
AFC TUNING METER OUTPUT
A.F.C. TUNING METER DRIVE CIRCUIT
IF INPUT
1
IF AMP
1st
2nd
3rd
4th
5th
6th
QUADRATURE DETECTOR
7
±100μA
3
2
FM DETECTOR
AF AMP
6
AUDIO OUT
(TO MULTIPLEX IC)
AF MUTE CONTROL
5
MUTING IN
15
LEVEL DETECTOR
LEVEL DETECTOR
LEVEL DETECTOR
LEVEL DETECTOR
ON
MUTING SW.
OFF
TO FRONT END DELAYED AGC
SIGNAL METER DRIVE CIRCUIT
MUT DRIVE CIRCUIT
12
MUTING OUT
4
14
16
200μA
13
TUNING METER OUTPUT
SIGNAL METER
(TO MULTIPLEX IC)

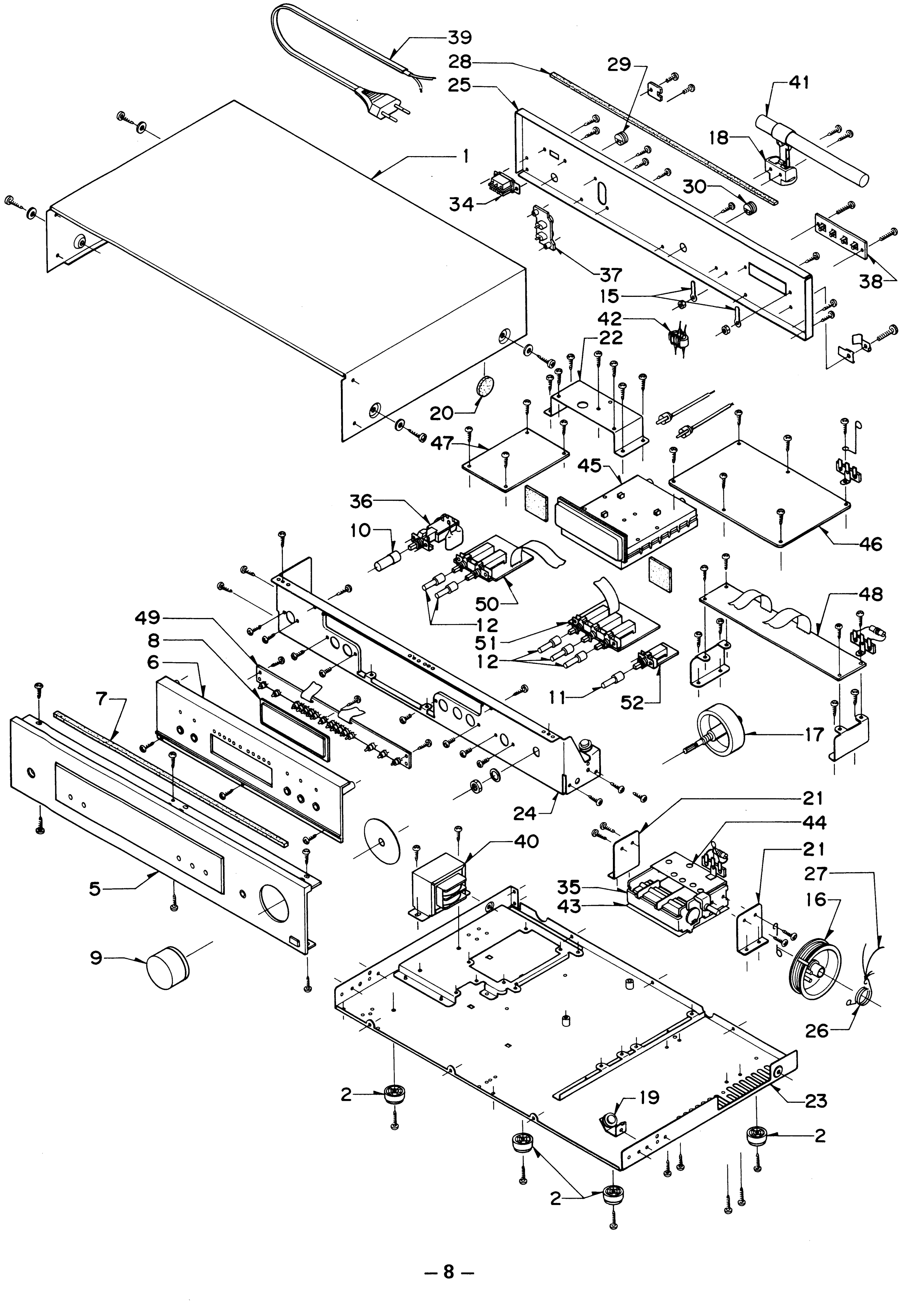
PRESCALAR IC MSL2318 SIGNAL FLOW


FM / 10
ECL
1 / 10
FM IN
FM IN
SW IN
470 Ω
10 k
Vcc
Vcc
AM IN
STTL
1 / 10
OUT
S1
S2

FREQUENCY COUNTER IC MSM5525 SIGNAL FLOW


a1 b1 c1 d1 c1 f1 g1
POINT
a2 b2 c2 d2 e2 f2 g2
a3 b3 c3 d3 e3 f3 g3
a4 d4 e4 g4 b4 c4
COM
AM OUT
FM OUT
BCD TO 7-SEGMENT DECODER/DRIVER
AM/FM GATE
DISPLAY CONTROL
VDD
S5
LOAD
LATCH
XT
XT
DIVIDER 1/2^17
VDD
CONTROL
50 Hz
RESET
PRESET
CE
FIN
GATE
1/8
1/10
1/10
1/10
1/10
1/3
VDD
S1
S2
S3
S4
AM/FM
DECODER
IF OFFSET ROM

CABINET & CHASSIS EXPLODED VIEW



39
28
29
25
41
18
1
30
34
37
38
15
42
22
20
47
45
36
46
10
50
48
12
49
51
8
12
6
11
52
7
17
24
21
44
40
21
27
35
16
43
5
9
26
2
19
23
2
2

PARTS LIST

PACKING PARTS LIST

Ref. No.	Parts Number	Description
	131 6 1139 72416	Box Corrugate-EXP
	131 6 2119 01441	Bag Polyethylene-EXP
	131 6 3009 26910	Pad (Right, Left)

ACCESSORIES PARTS LIST

Ref. No.	Parts Number	Description
	131 0 4004 11501	W Pin Cord
	131 2 1801 13900	Leg
	131 6 2719 10801	Bag Fan
	131 6 2719 11300	Bag Fan
	131 6 4119 72702	Explanatory Booklet
	131 6 4519 15700	Guarantee Card
	4 2449 20230	Antenna FM

CABINET PARTS LIST

Ref. No.	Parts Number	Description
1	131 2 1410 21501	Cover
2	131 2 1801 12900	Leg

APPEARANCE PARTS LIST

Ref. No.	Parts Number	Description
5	131 0 1016 33401	Panel Decorative Assy (Silver)
	131 0 1016 33402	Panel Decorative Assy (Black)
6	131 2 1204 00302	Panel Sub
7	131 2 5205 15300	Cushion
8	131 2 6308 18000	Filter
9	131 0 1001 48200	Knob, Tuning (Silver)
	131 0 1001 48270	Knob, Tuning (Black)
10	131 0 1001 52600	Knob, Power (Silver)
	131 0 1001 52601	Knob, Power (Black)
11	131 0 1001 48400	Knob, FM Muting (Silver)
	131 0 1001 48403	Knob, FM Muting (Black)
12	131 0 1001 49900	Knob, Push Switch (Silver)
	131 0 1001 49903	Knob, Push Switch (Black)

CHASSIS PARTS LIST

Ref. No.	Parts Number	Description
15	4 2379 21520	Terminal Lug 1P
16	131 0 3002 11100	Drum Assy
17	131 0 3003 20000	Shaft Dial Assy
18	131 0 3008 11900	Support Antenna Assy
19	131 0 3020 11000	Pulley Assy
20	131 2 1801 13900	Leg (Cover)
21	131 2 3101 56400	Metal Mount (Vari. Con.)
22	131 2 3101 63100	Metal Mount (Degitron)
23 *	131 2 3301 24401	Chassis
24 *	131 2 3305 24501	Panel Front
25 *	131 2 3306 27204	Panel Rear
26	131 2 4111 00400	Spring Rope

CHASSIS PARTS LIST

Ref. No.	Parts Number	Description
27	131 2 4112 10200	Rope 0.5
28	131 2 5205 15300	Cushion (Panel Rear)
29	131 2 6111 14200	Bushing (AC Cord 4N-4)
30	131 2 6111 14200	Bushing (Antenna Lead 4N-4)

ELECTRICAL PARTS LIST

Ref. No.	Parts Number	Description
34	4 2312 01020	Switch Slide
35	4 1252 00160	Front End
36	4 2312 01400	Switch Push Power
37	4 2359 23070	RCA 2P Jack
38	4 2379 21460	Terminal 4P
39	4 2439 20526	Power Cord
40	4 2512 07120	Power Transformer
41	4 2579 25130	Bar Antenna AM
42	4 2599 20300	Balun
43	131 2 6101 27000	Plate Shield
44	131 2 6103 18600	Cover Shield
45 *	131 0 4014 00101	Digital Unit Assy
46 *	131 0 4001 94901	IF/MPX P.C.B Assy
47 *	131 0 4001 00452	Power Supply P.C.B Assy
48 *	131 0 4001 00401	Meter P.C.B Assy
49 *	131 0 4001 00441	LED P.C.B Assy
50 *	131 0 4001 00411	OSC/High Blend P.C.B Assy
51 *	131 0 4001 00421	Function P.C.B Assy
52 *	131 0 4001 00431	Muting P.C.B Assy
C01,03	C2EHRM103A	Metallized Paper 0.01 μF 250V ±20%
C02	C1HCDD100SL	Ceramic 10 pF 50V ±0.5%
L01,02	4 2539 20120	IF Trap
R01	R2HCPK222A	Solid 2.2k 1/2W ±10%

*—Not a Service Part.

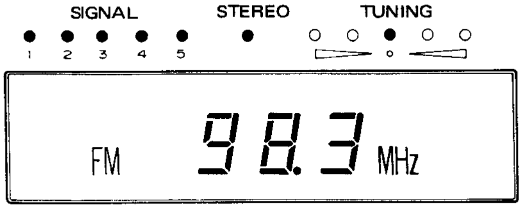
TUNER OPERATION

LISTENING TO FM BROADCASTS

1. Switch on the power.
   Set the POWER switch to ON after you have turned down the sound volume control on the system amplifier.
2. Depress the FM AUTO function switch.
3. Rotate the tuning knob and set it to the frequency of the broadcasting station whose program you want to hear.
4. Adjust the knob so that all the SIGNAL LED indicators up to number 5 have come on.
   If the signals from the station are weak, number 5 LED may not come on.
5. Finely adjust the tuning knob and the optimum tuning point will be obtained when only the center green TUNING LED indicator comes on.
   If the signals from the station are weak, this green LED may not come on.
6. Operate the amplifier controls and set the volume and tone quality to produce the sound of your preference.

CAUTION:
The frequency of a station is, for example, 98.3 MHz.
In cases like this, the frequency may shift from 98.3 MHz to 98.2 MHz or 98.4 MHz but this does not indicate that anything is wrong with the tuner. Simply adjust so that the center green TUNING LED comes on, and listen to the program.

The tuner is now fully adjusted.



This is the optimum tuning mode.

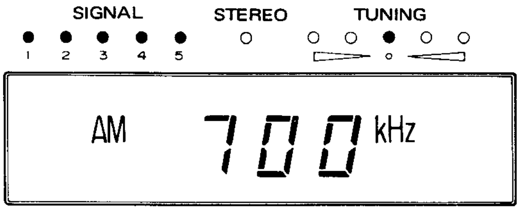
NOTE:
(1) If you hear any noise during a stereo broadcast with the FM AUTO function switch depressed, set the MPX FILTER switch to ON (depressed position), and this will reduce the amount of noise. Alternatively, depress the FM MONO function switch and although you will hear the program in mono, the amount of noise will be reduced and the reception improved.
(2) If the FM MUTING switch is set to ON (released position), you will not hear the irritating interstation noise when tuning. However, if the signals from the broadcasting station are weak, the sound may disappear or come on and off. In cases like this, set the FM MUTING switch to OFF (depressed position).
(3) The wrong type of antenna or poor antenna installation are frequent causes of poor FM reception. Read carefully the instructions given in the section entitled "INSTALLATION OF FM ANTENNAS".

LISTENING TO AM BROADCASTS

1. Depress the AM function switch.
2. Rotate the tuning knob and set it to the frequency of the broadcasting station whose program you want to hear.
3. Adjust the knob so that all the SIGNAL LED indicators up to number 5 have come on. This is the optimum tuning point.
   If the signals from the station are weak, number 5 LED may not come on.
4. When the AM broadcast is received and the signal-to-noise ratio is over 30 dB (with good reception and minimal noise), the center green TUNING LED indicator comes on.
5. Operate the amplifier controls and set the volume and tone quality to produce the sound of your preference.

(The frequency of this station is, for instance, 700 kHz.)

The tuner is now fully adjusted.



This is the optimum tuning mode.

NOTE:
A humming noise during AM broadcast reception may be caused by the AC power line. This problem can be remedied by taking the following measures.
(1) Position the power cord away from the antenna line and the ferrite bar antenna.
(2) Unplug the power cord, reverse the position of the prongs and plug it in again.
(3) Adjust the position of the ferrite bar antenna.

FM TUNER ALIGNMENT

FM ALIGNMENT – FUNCTION switch to FM, MUTING switch to OFF, VOLUME control to minimum.

Maintain generator output as low as possible for suitable indications.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
NOTE: The FM IF circuit utilizes a non-turnable ceramic filter which establishes the IF bandpass. To insure symmetrical tuning and selectivity, the IF must be aligned precisely to the center of the filter bandpass, rather than to 10.7 MHz as in conventional LC circuits.				
1. IF ALIGNMENT	Connect 10.7 MHz Sweep Generator to VC2 and, ground lead to chassis. Markers are not required. Set generator output to –12dB (250mV).	Position of non-interference	Scope vertical input to TP1, and connect ground lead to chassis. Set vertical sensitivity to 0.5V/cm.	Adjust L05 (in the Front End IFT) for maximum gain and best symmetry. See Figure 1 for FM IF ALIGNMENT.
2. PRELIMINARY DETECTOR ALIGNMENT	Generator connections are the same as above. Adjust for S-curve display. Set generator output to –20dB. (100mV)	Position of non-interference	Scope vertical input to TP2.	Adjust T01 (bottom slug) for minimum gain and best linearity. Adjust T01 (top slug) for maximum gain and best linearity. See Figure 2 for FM DETECTOR ALIGNMENT. NOTE: Harmonic Distortion test must be performed as part of detector alignment.
NOTE: Connect 120-ohm composition resistors in series with each lead from the RF generator to match the 50-ohm output to the 300-ohm input impedance. Generator output voltage is reduced to one-half at antenna terminals. Signal voltages specified in this table are generator output levels, *not* antenna voltages.				
3. FRONT END ALIGNMENT (106 MHz)	Change generator setting to 106 MHz.	106 MHz	Front Panel Signal Strength Display (M1) and Tuning Display (M2)	Adjust TC4 (OSC), TC3, TC2, and TC1 for maximum deflection on M1 and zero deflection of M2.
4. DETECTOR ALIGNMENT	Set generator to receiver frequency. Modulate with 400 Hz ±75 kHz deviation. Connect generator to FM ANT terminals.	Position of non-interference near 100 MHz.	Scope vertical input to TUNER OUTPUT jack.	Reduce generator output for noise to be visible on sine wave. Readjust generator frequency to center noise on positive and negative half cycles. See Figure 3 for SYMMETRICAL TUNING RESPONSE.
5. FINAL DETECTOR ADJUSTMENT (MINIMUM T.H.D.)	Same as above. Increase generator output to 2mV.	Same as in Step 4	AC Voltmeter and Harmonic Distortion Analyzer to LEFT TUNER OUTPUT jack	Adjust T01 (bottom slug) for center of channel indication on M2 and minimum distortion. (THD 0.3% typically).
6. PLL IC F.R.F. (76 kHz)	Do not connect generator.	Same as in Step 4	Connect frequency counter to TP3.	Adjust VR03 (4.7k) in Multiplex circuit to obtain 76 kHz±200 Hz on counter. See Figure 4 for SAW TOOTH WAVE FORM. NOTE: Connect Buffer Amp of a high input impedance (over 500k-ohm) to TP3 and then, to the frequency counter through 220 k-ohm.
7. PILOT CANCEL ADJUSTMENT	Set generator to receiver frequency. Modulate with 19 kHz ±7.5 kHz deviation (Pilot Signal). Connect generator to FM ANT terminals.	Position of non-interference near 100 MHz.	Scope vertical input to LEFT TUNER OUTPUT jack. Same as above for RIGHT channel	Adjust VR04 (47k) until the residue of pilot signal in R and L channels becomes minimum.

FM TUNER ALIGNMENT

– continued –

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
8. FM STEREO SIGNAL SEPARATION CONTROL	Connect FM stereo SG to FM ANT terminals. 19 kHz signal ON. Main channel, sub channel signal ON. Apply 1000 Hz signal from L Ch.	Same as above	Scope and AC-VTVM to RIGHT TUNER OUTPUT jack.	Adjust VR05 (22k) for minimum output.
	Same as above for RIGHT channel.		Scope and AC-VTVM to LEFT TUNER OUTPUT jack.	

AM TUNER ALIGNMENT

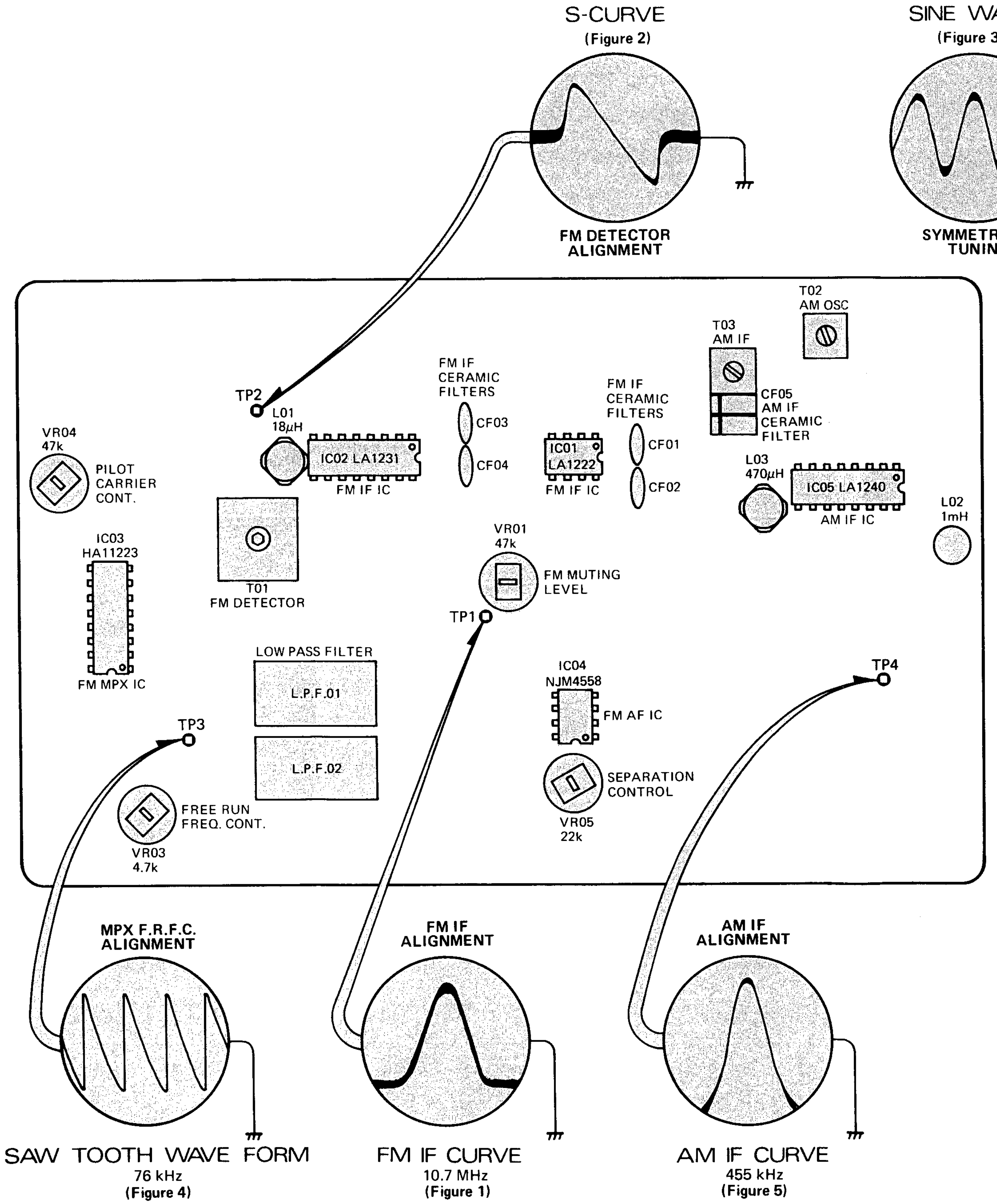
AM ALIGNMENT – GRAPHIC EQUALIZER switch to OFF, SPEAKERS switch to PHONES position, FUNCTION switch to AM position, and VOLUME to MIN.

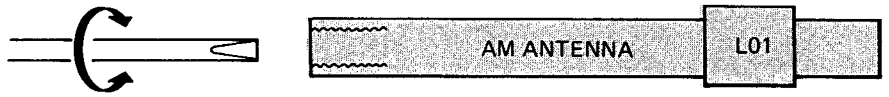
Maintain generator output as low as possible for suitable indications.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. IF ALIGNMENT	Connect 455 kHz sweep generator to VC5 and ground lead to chassis. Use 0.1 μF capacitor in series with generator lead.	Position of non-interference near 1400 kHz.	Scope vertical input to TP4 and ground lead to chassis. Set vertical sensitivity to 0.2 V/cm	Adjust T03 (IFT) (top slug) for maximum gain and best symmetry. Keep signal low enough for noise on response as shown in Figure 5.
2. FRONT END ALIGNMENT (600 kHz)	AM generator to EXT AM ANT and GND terminals. Set to 600 kHz. Modulate with 400 Hz (30% modulation).	600 kHz	Front panel Signal Strength Display (M1)	Adjust T02 (OSC) and L01 (AM ANTENNA) for maximum M1 indication.
3. FRONT END ALIGNMENT (1400 kHz)	Change generator setting to 1400 kHz.	1400 kHz	Front panel Signal Strength Display (M1)	Adjust TC5 and TC6 (OSC) for maximum deflection. Keep meter reading below 3. Repeat steps 2 and 3 until optimum alignment is reached.

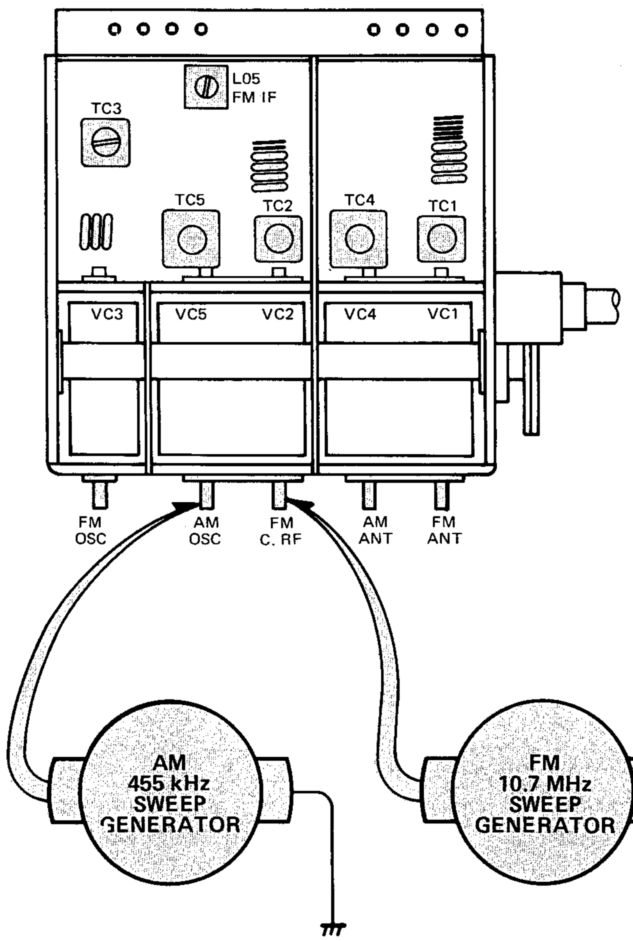
IF/MPX P.C.BOARD LAYOUT

WITH OSCILLOSCOPE TIME BASE SETTINGS
(TOP VIEW)


S-CURVE
(Figure 2)
FM DETECTOR ALIGNMENT
SINE WAVE
(Figure 3)
SYMMETRICAL TUNING
T02
AM OSC
T03
AM IF
FM IF CERAMIC FILTERS
FM IF CERAMIC FILTERS
CF05
AM IF CERAMIC FILTER
TP2
L01
18μH
CF03
CF04
CF01
CF02
VR04
47k
PILOT CARRIER CONT.
IC02 LA1231
FM IF IC
IC01 LA1222
FM IF IC
L03
470μH
IC05 LA1240
AM IF IC
L02
1mH
IC03
HA11223
FM MPX IC
T01
FM DETECTOR
VR01
47k
FM MUTING LEVEL
TP1
LOW PASS FILTER
L.P.F.01
L.P.F.02
TP3
IC04
NJM4558
FM AF IC
TP4
FREE RUN FREQ. CONT.
VR03
4.7k
SEPARATION CONTROL
VR05
22k
MPX F.R.F.C. ALIGNMENT
FM IF ALIGNMENT
AM IF ALIGNMENT
SAW TOOTH WAVE FORM
76 kHz
(Figure 4)
FM IF CURVE
10.7 MHz
(Figure 1)
AM IF CURVE
455 kHz
(Figure 5)

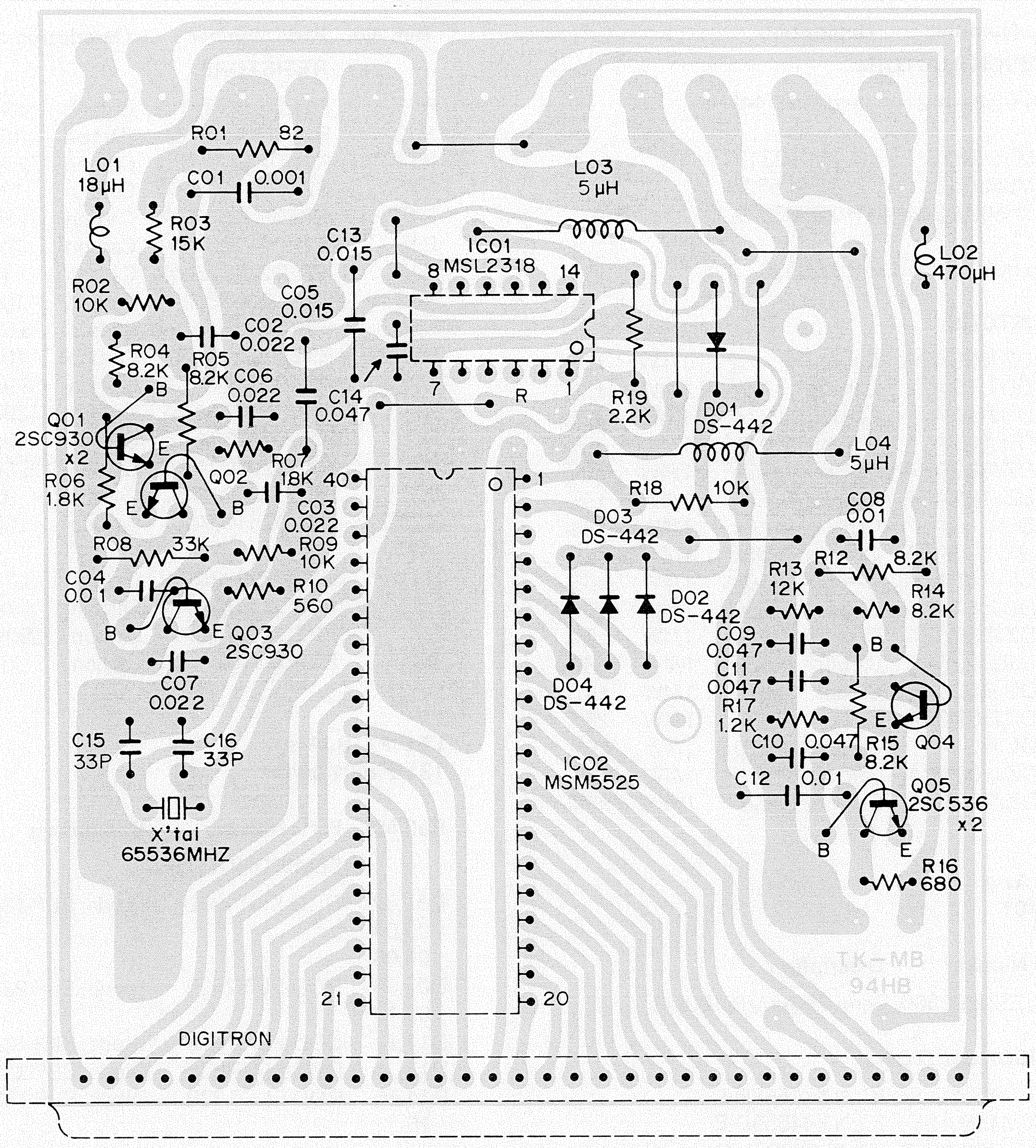

AM ANTENNA
L01

FRONT END


L05
FM IF
TC3
TC5
TC2
TC4
TC1
VC3
VC5
VC2
VC4
VC1
FM OSC
AM OSC
FM C. RF
AM ANT
FM ANT
AM 455 kHz SWEEP GENERATOR
FM 10.7 MHz SWEEP GENERATOR

COUNTER P.C.BOARD

(BOTTOM VIEW)


R01 82
L01 18μH
C01 0.001
R03 15K
L03 5μH
C13 0.015
IC01 MSL2318
8
14
L02 470μH
R02 10K
C05 0.015
C02 0.022
R04 8.2K
R05 8.2K
C06 0.022
C14 0.047
7
R
1
R19 2.2K
D01 DS-442
Q01 2SC930 x2
B
E
R07 18K
L04 5μH
R06 1.8K
Q02
40
1
R18 10K
C03 0.022
D03 DS-442
C08 0.01
R08 33K
R09 10K
R12 8.2K
R13 12K
C04 0.01
R10 560
D02 DS-442
R14 8.2K
E Q03 2SC930
C09 0.047
C11 0.047
C07 0.022
D04 DS-442
R17 1.2K
C15 33P
C16 33P
C10 0.047
R15 8.2K
Q04
IC02 MSM5525
C12 0.01
Q05 2SC536 x2
X'tal 65536MHZ
R16 680
21
20
DIGITRON
TK-MB 94HB

PARTS LIST

DIGITAL UNIT ASSY
131 0 4014 00101

Ref. No.	Parts Number	Description
	131 0 3018 00400	Cover Shield Assy
C01,02 03,04 05,06 07	4 2232 00210	Ceramic TF 1000 pF 50V
R01	R2EDPJ123A	Carbon 12k 1/4W ±5%
	131 0 4001 02161	Counter P.C.B Assy
	4 2142 00010	Digitron
	4 2252 00040	Crystal OSC
L01	4 2532 00030	Choke Coil 18 μH
L02	4 2532 00020	Choke Coil 470 μH
L03,04	4 2539 20210	Choke Coil 5 μH

Ref. No.	Parts Number	Description
	CAPACITORS	
C01	C1HCZK102BPA	Ceramic 1000 pF 50V ±10%
C02,03	C1HYSZ223A	Ceramic 0.022 μF 50V +80,−20%
C04	C1HYSZ103A	Ceramic 0.01 μF 50V +80,−20%
C05	C1ECZN153XPA	Ceramic 15000 pF 25V ±30%
C06,07	C1HYSZ223A	Ceramic 0.022 μF 50V +80,−20%
C08	C1HYSZ103A	Ceramic 0.01 μF 50V +80,−20%
C09,10 11	C1HYSZ473A	Ceramic 0.047 μF 50V +80,−20%
C12	C1HYSZ103A	Ceramic 0.01 μF 50V +80,−20%
C13	C1ECZN153XPA	Ceramic 15000 pF 25V ±30%
C14	C1HYSZ473A	Ceramic 0.047 μF 50V +80,−20%
C15,16	C1HCSK330SL	Ceramic 33 pF 50V ±10%

PARTS LIST (Continued)

Ref. No.	Parts Number	Description				
	SEMICONDUCTORS					
D01,02 03,04	205 5 9040 44210	Diode, DS-442				
IC01	IPP-MSL-2318	IC, MSL-2318				
IC02	IPP-MSM-5525	IC, MSM-5525				
Q01,02 03	203 5 5500 93040	TR 2SC930 D, E				
Q04,05	203 5 5000 53660	TR 2SC536				
	RESISTORS					
R01	R2EDZJ820APA	Carbon	82	1/4W	±5%	
R02	R2EDUJ103A	Carbon	10k	1/4W	±5%	
R03	R2EDUJ153A	Carbon	15k	1/4W	±5%	
R04	R2EDUJ822A	Carbon	8.2k	1/4W	±5%	
R05	R2EDZJ882APA	Carbon	8.2k	1/4W	±5%	
R06	R2EDZJ182APA	Carbon	1.8k	1/4W	±5%	
R07	R2EDUJ182A	Carbon	1.8k	1/4W	±5%	
R08	R2EDZJ333APA	Carbon	33k	1/4W	±5%	
R09	R2EDUJ103A	Carbon	10k	1/4W	±5%	
R10	R2EDUJ561A	Carbon	560	1/4W	±5%	
R12	R2EDZJ882APA	Carbon	8.2k	1/4W	±5%	
R13	R2EDJU123A	Carbon	12k	1/4W	±5%	
R14	R2EDUJ882A	Carbon	8.2k	1/4W	±5%	
R15	R2EDZJ882APA	Carbon	8.2k	1/4W	±5%	
R16,17	R2EDUJ821A	Carbon	820	1/4W	±5%	
R18	R2EDZJ103APA	Carbon	10k	1/4W	±5%	
R19	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%	

METER P.C.B. Assy
131 0 4001 00401

Ref. No.	Parts Number	Description			
VR01	4 2222 00300	Semi-Fixed VR 100k-B			
	SEMICONDUCTORS				
IC01	IJJ-NJM4558D-E	IC, NJM4558D-E			
	IJJ-NJM4559D-E	IC, NJM4559D-E			
Q01,02 03,04 05,06 07,08 09	203 5 5000 53660	TR 2SC536 F, G			
Q10,11	TTT-2SA1015-Y	TR 2SA1015 Y			
	RESISTORS				
R01	R2EDZJ154APA	Carbon	150k	1/4W	±5%
R02	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R03	R2EDZJ564APA	Carbon	560k	1/4W	±5%
R04	R2EDZJ184APA	Carbon	180k	1/4W	±5%
R05	R2EDZJ473APA	Carbon	47k	1/4W	±5%
R06	R2EDZJ271APA	Carbon	270	1/4W	±5%
R07	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R08	R2EDZJ684APA	Carbon	680k	1/4W	±5%
R09	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R10	R2EDZJ682APA	Carbon	6.8k	1/4W	±5%
R11	R2EDZJ103APA	Carbon	10k	1/4W	±5%

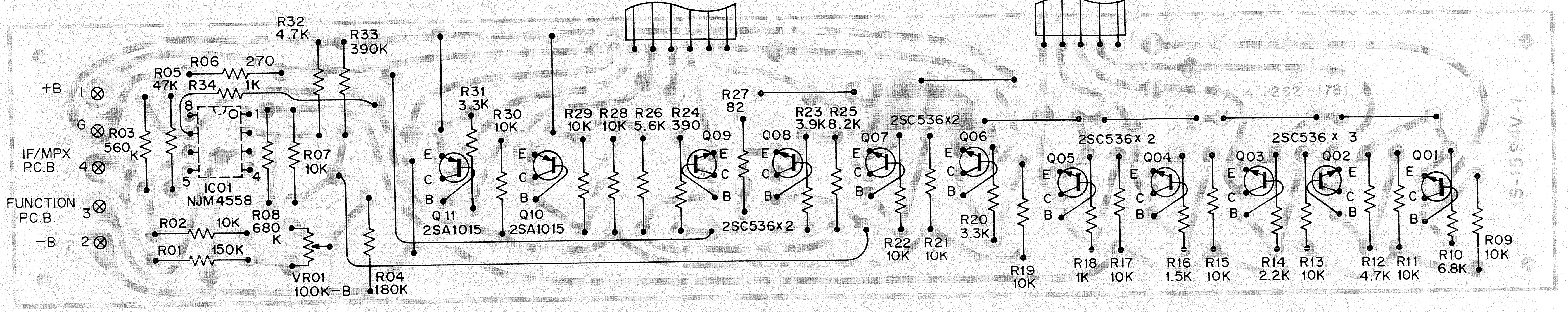
Ref. No.	Parts Number	Description			
	RESISTORS				
R12	R2EDZJ472APA	Carbon	4.7k	1/4W	±5%
R13	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R14	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%
R15	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R16	R2EDZJ152APA	Carbon	1.5k	1/4W	±5%
R17	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R18	R2EDZJ102APA	Carbon	1k	1/4W	±5%
R19	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R20	R2EDZJ332APA	Carbon	3.3k	1/4W	±5%
R21,22	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R23	R2EDZJ392APA	Carbon	3.9k	1/4W	±5%
R24	R2EDZJ391APA	Carbon	390	1/4W	±5%
R25	R2EDZJ822APA	Carbon	8.2k	1/4W	±5%
R26	R2EDZJ562APA	Carbon	5.6k	1/4W	±5%
R27	R2EDZJ820APA	Carbon	82	1/4W	±5%
R28,29 30	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R31	R2EDZJ332APA	Carbon	3.3k	1/4W	±5%
R32	R2EDZJ472APA	Carbon	4.7k	1/4W	±5%
R33	R2EDZJ394APA	Carbon	390k	1/4W	±5%
R34	R2EDPJ102A	Carbon	1k	1/4W	±5%

LED P.C.B. Assy
131 0 4001 00441

Ref. No.	Parts Number	Description			
	SEMICONDUCTORS				
D01,02 03,04 05,06	DOO-SLP-132B	Diode, SLP-132B			
D07,08 09.10	DOO-SLP-232B	Diode, SLP-232B			
D11,12	DOO-SLP-132B	Diode, SLP-132B			
D13	DOO-SLP-232B	Diode, SLP-232B			
D14,15 16	DOO-SLP-132B	Diode, SLP-132B			
	RESISTORS				
R01,02 03,04 05,06	R2EDZJ122APA	Carbon	1.2k	1/4W	±5%
R07	R2EDZJ681APA	Carbon	680	1/4W	±5%
R08,09	R2EDZJ561APA	Carbon	560	1/4W	±5%
R10	R2EDZJ471APA	Carbon	470	1/4W	±5%
R11	R2EDZJ102APA	Carbon	1k	1/4W	±5%
R12,13	R2EDZJ122APA	Carbon	1.2k	1/4W	±5%
R14	R2EDZJ102APA	Carbon	1k	1/4W	±5%

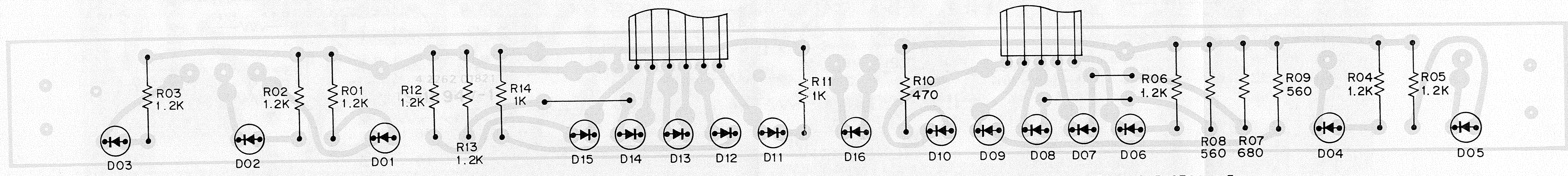
METER PRINTED CIRCUIT BOARD

(BOTTOM VIEW)


+B 1
G
IF/MPX P.C.B. 4
FUNCTION P.C.B. 3
-B 2
R03 560K
R05 47K
R06 270
R34 1K
R32 4.7K
R33 390K
IC01 NJM4558
R07 10K
R08 680K
R02 10K
R01 150K
VR01 100K-B
R04 180K
R31 3.3K
Q11 2SA1015
R30 10K
Q10 2SA1015
R29 10K
R28 10K
R26 5.6K
R24 390
Q09
R27 82
Q08
2SC536x2
R23 3.9K
R25 8.2K
Q07
2SC536x2
Q06
R22 10K
R21 10K
R20 3.3K
R19 10K
Q05
2SC536 x 2
Q04
R18 1K
R17 10K
R16 1.5K
R15 10K
Q03
2SC536 x 3
Q02
R14 2.2K
R13 10K
Q01
R12 4.7K
R11 10K
R10 6.8K
R09 10K
E
C
B
4 2262 01781
IS-15 94V-1

L.E.D. PRINTED CIRCUIT BOARD

(BOTTOM VIEW)

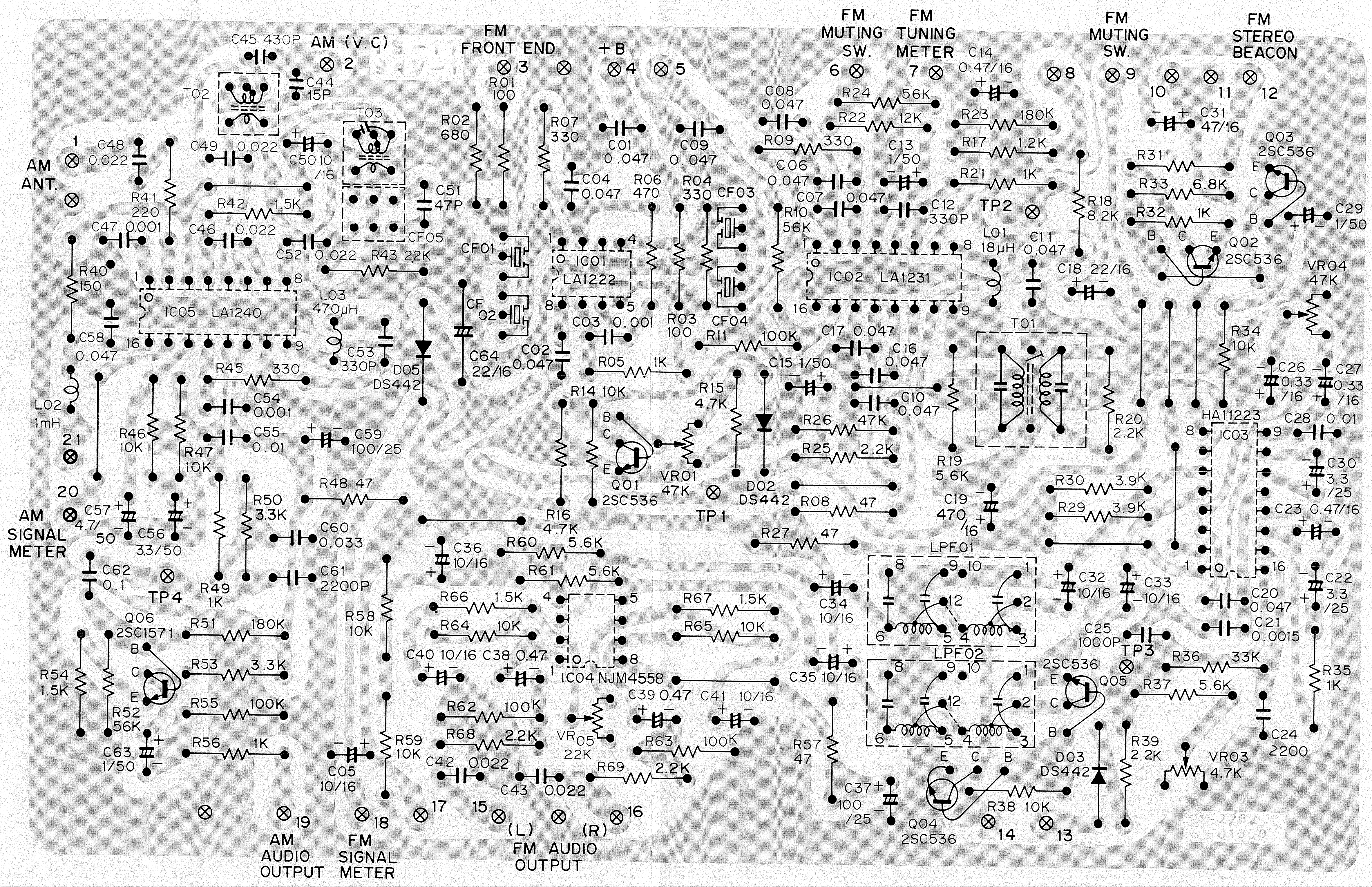

R03 1.2K
D03
R02 1.2K
D02
R01 1.2K
D01
R12 1.2K
R13 1.2K
R14 1K
D15
D14
D13
D12
D11
R11 1K
D16
R10 470
D10
D09
D08
D07
D06
R06 1.2K
R08 560
R07 680
R09 560
D04
R04 1.2K
R05 1.2K
D05

D01 ~ 06, 11,12,14~16 : SLP-132B x 11

D07 ~ 10 , 13 SLP-232B x 5

IF/MPX PRINTED CIRCUIT BOARD

(BOTTOM VIEW)


AM ANT.
1
AM (V.C)
2
FM FRONT END
3
+B
4
5
FM MUTING SW.
6
FM TUNING METER
7
8
FM MUTING SW.
9
FM STEREO BEACON
10
11
12
13
14
15
16
(L)
(R)
FM AUDIO OUTPUT
17
18
FM SIGNAL METER
19
AM AUDIO OUTPUT
20
AM SIGNAL METER
21
TP1
TP2
TP3
TP4
C45 430P
C44 15P
T02
T03
C48 0.022
C49 0.022
C50 10/16
C51 47P
CF05
R41 220
R42 1.5K
C47 0.001
C46 0.022
C52 0.022
R43 22K
R40 150
IC05 LA1240
C58 0.047
L03 470μH
C53 330P
D05 DS442
L02 1mH
R45 330
C54 0.001
C55 0.01
C59 100/25
R46 10K
R47 10K
C57 4.7/50
C56 33/50
R48 47
R50 3.3K
C60 0.033
C62 0.1
R49 1K
C61 2200P
Q06 2SC1571
R51 180K
R53 3.3K
R54 1.5K
R52 56K
R55 100K
C63 1/50
R56 1K
R58 10K
C05 10/16
R59 10K
R01 100
R02 680
R07 330
C01 0.047
C09 0.047
C04 0.047
R06 470
R04 330
CF03
CF01
CF02
IC01 LA1222
C64 22/16
C02 0.047
C03 0.001
R03 100
CF04
R05 1K
R11 100K
R14 10K
R15 4.7K
Q01 2SC536
VR01 47K
D02 DS442
R16 4.7K
C36 10/16
R60 5.6K
R61 5.6K
R66 1.5K
R64 10K
IC04 NJM4558
R67 1.5K
R65 10K
C40 10/16
C38 0.47
C39 0.47
C41 10/16
R62 100K
R68 2.2K
VR05 22K
R63 100K
C42 0.022
C43 0.022
R69 2.2K
C08 0.047
R24 56K
R22 12K
R09 330
C13 1/50
C06 0.047
C07 0.047
C12 330P
R10 56K
C14 0.47/16
R23 180K
R17 1.2K
R21 1K
IC02 LA1231
L01 18μH
C11 0.047
C18 22/16
C17 0.047
C16 0.047
C15 1/50
C10 0.047
R26 47K
R25 2.2K
R08 47
R27 47
R19 5.6K
C19 470/16
T01
R20 2.2K
R18 8.2K
C31 47/16
R31
R33 6.8K
R32 1K
Q03 2SC536
Q02 2SC536
C29 1/50
VR04 47K
R34 10K
C26 0.33/16
C27 0.33/16
HA11223
IC03
C28 0.01
C30 3.3/25
C23 0.47/16
R30 3.9K
R29 3.9K
LPF01
LPF02
C34 10/16
C35 10/16
C32 10/16
C33 10/16
C20 0.047
C21 0.0015
C22 3.3/25
C25 1000P
2SC536
Q05
R36 33K
R37 5.6K
R35 1K
C24 2200
R57 47
C37 100/25
Q04 2SC536
R38 10K
D03 DS442
R39 2.2K
VR03 4.7K
E C B
4-2262
-01330

IC PIN NUMBERS VOLTAGES																	
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC01	LA1221	1.3V	1.3V	0V	9.6V	10.3V	1.3V	8.2V	10.3V	–	–	–	–	–	–	–	–
IC02	LA1231	2.9V	2.9V	2.9V	0V	0V	6.2V	5.7V	5.6V	5.6V	5.6V	10.7V	0V	3.3V	0V	4.5V	0V
IC03	HA11223	11.0V	3.5V	4.6V	0.7V	7.5V	7.5V	0V	0.9V	5.8V	2.7V	2.7V	–	2.7V	2.7V	4.0V	3.0V
IC04	NJM4558	6.0V	6.0V	6.0V	0V	6.0V	6.0V	6.0V	11.6V	–	–	–	–	–	–	–	–
IC05	LA1240	4.7V	1.7V	11.0V	8.7V	11.0V	3.3V	1.3V	2.7V	8.8V	0V	11.4V	2.0V	0.6V	2.0V	0.2V	1.2V

TRANSISTOR DC VOLTAGES									
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q01	2SC536	0.6V	0V	0V	Q04	2SC536	0V	1.3V	0V
Q02	2SC536	1.6V	1.0V	1.0V	Q05	2SC536	0V	1.9V	0V
Q03	2SC536	0V	1.6V	0V	Q06	2SC1571	2.6V	2.0V	7.0V

PARTS LIST

IF/MPX P.C.B. Assy
131 0 4001 94901

Ref. No.	Parts Number	Description
CF01,02 03,04	4 2272 00040	Ceramic Filter
CF05	4 2272 00030	Ceramic Filter
LPF1,2	4 2522 00020	Low Pass Filter
L01	4 2532 00030	Choke Coil 18 μH
L02	4 2539 20170	Choke Coil 1 mH
L03	4 2532 00020	Choke Coil 470 μH
T01	4 2569 21320	IF Transformer FM (Quadrature)
T02	4 2582 00050	OSC Coil AM
T03	4 2562 00040	IF Transformer AM (AM IFT)
VR01	4 2229 25100	VR 47k-B (Muting)
VR03	4 2229 23880	VR 4.7k-B (Free Run)
VR04	4 2229 25100	VR 47k-B (Pilot Cancel)
VR05	4 2229 25670	VR 22k-B (Sepa. Con.)

CAPACITORS

Ref. No.	Parts Number	Description
C01,02	C1HYYZ473APA	Ceramic 0.047 μF 50V +80,–20%
C03	C1HYYZ102APA	Ceramic 0.001 μF 50V +80,–20%
C04	C1HYYZ473APA	Ceramic 0.047 μF 50V +80,–20%
C05	C1CRY-106APA	Electrolytic 10 μF 16V
C06,07 08,09 10,11	C1HYYZ473APA	Ceramic 0.047 μF 50V +80,–20%
C12	C1HCYK331APA	Ceramic 330 pF 50V ±10%
C13	C1HRY-105APA	Electrolytic 1 μF 50V
C14	C1CUBX474A	Sint. Alu. 0.47 μF 16V +40,–20%
C15	C1HRY-105APA	Electrolytic 1 μF 50V
C16,17	C1HYYZ473APA	Ceramic 0.047 μF 50V +80,–20%
C18	C1CRY-226APA	Electrolytic 22 μF 16V
C19	C1CRE-477A	Electrolytic 470 μF 16V
C20	C1HFYK473APA	Mylar 0.047 μF 50V ±10%
C21	C1HFYK152APA	Mylar 0.0015 μF 50V ±10%
C22	C1EUBM335A	Sint. Alu. 3.3 μF 25V ±20%
C23	C1CUBX474A	Sint. Alu. 0.47 μF 16V +40,–20%
C24	C1HFYK222APA	Mylar 0.0022 μF 50V ±10%
C25	C1HSEK102A	Styrol 1000 pF 50V ±10%
C26,27	C1CUBX334A	Sint. Alu. 0.33 μF 16V +40,–20%
C28	C1HFYK103APA	Mylar 0.01 μF 50V ±10%
C29	C1HRY-105APA	Electrolytic 1 μF 50V
C30	C1EUBM335A	Sint. Alu. 3.3 μF 25V ±20%
C31	C1CRY-476APA	Electrolytic 47 μF 16V
C32,33 34,35 36	C1CRY-106APA	Electrolytic 10 μF 16V
C37	C1ERE-107A	Electrolytic 100 μF 25V
C38,39	C1AUEX474A	Sint. Alu. 0.47 μF 10V +40,–20%
C40,41	C1CRY-106APA	Electrolytic 10 μF 16V
C42,43	C1HFAJ223A	Mylar 0.022 μF 50V ±5%
C44	C1HCDJ150WK	Ceramic 15 pF 50V ±5%
C45	C1HSEJ431A	Styrol 430 pF 50V ±5%
C46	C1HYYZ223APA	Ceramic 0.022 μF 50V +80,–20%
C47	C1HYYZ102APA	Ceramic 0.001 μF 50V +80,–20%
C48,49	C1HYYZ223APA	Ceramic 0.022 μF 50V +80,–20%
C50	C1CRY-106APA	Electrolytic 10 μF 16V
C51	C1HCYK470APA	Ceramic 47 pF 50V ±10%
C52	C1HYYZ223APA	Ceramic 0.022 μF 50V +80,–20%
C53	C1HCYK331APA	Ceramic 330 pF 50V ±10%
C54	C1HYYZ102APA	Ceramic 0.001 μF 50V +80,–20%
C55	C1HFYK103APA	Mylar 0.01 μF 50V ±10%
C56	C1HRY-335APA	Electrolytic 3.3 μF 50V
C57	C1ERY-475APA	Electrolytic 4.7 μF 25V
C58	C1HYYZ473APA	Ceramic 0.047 μF 50V +80,–20%
C59	C1ERE-107A	Electrolytic 100 μF 25V
C60	C1HFYK333APA	Mylar 0.033 μF 50V ±10%
C61	C1HFYK222APA	Mylar 0.0022 μF 50V ±10%
C62	C1HFAK104A	Mylar 0.1 μF 50V ±10%
C63	C1HRY-105APA	Electrolytic 1 μF 50V
C64	C1CRY-226APA	Electrolytic 22 μF 16V

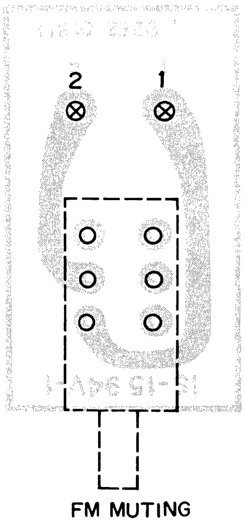
SEMICONDUCTORS

Ref. No.	Parts Number	Description
D02,03 04,05	205 5 9040 44210	Diode, DS-442
IC01	206 5 0131 22210	IC, LA1222
IC02	206 5 0161 23110	IC, LA1231
IC03	IKK-HA11223W	IC, HA-11223
IC04	IJJ-NJM4558D-D	IC, NJM4558D-D
IC05	206 5 0171 24010	IC, LA1240
Q01,02 03,04 05	203 5 5000 53660	TR 2SC536
Q06	203 5 5251 57170	TR 2SC1571 G, H

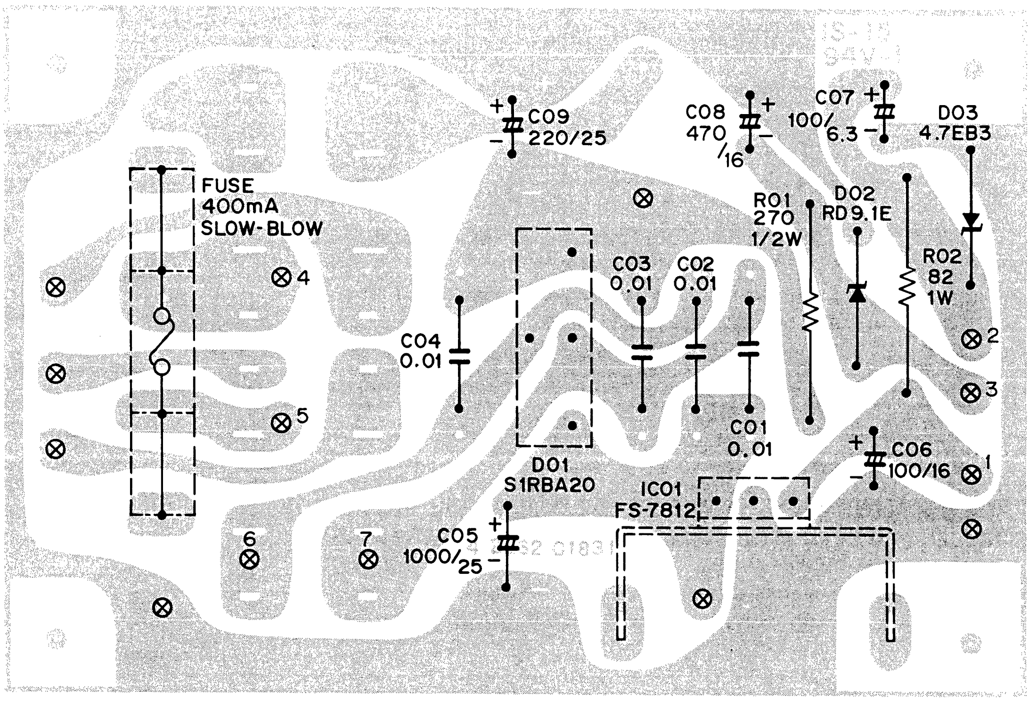
RESISTORS

Ref. No.	Parts Number	Description
R01	R2EDZJ101APA	Carbon 100 1/4W ±5%
R02	R2EDZJ681APA	Carbon 680 1/4W ±5%
R03	R2EDZJ101APA	Carbon 100 1/4W ±5%
R04	R2EDZJ331APA	Carbon 330 1/4W ±5%
R05	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R06	R2EDZJ471APA	Carbon 470 1/4W ±5%
R07	R2EDZJ331APA	Carbon 330 1/4W ±5%
R08	R2EDZJ470APA	Carbon 47 1/4W ±5%
R09	R2EDZJ331APA	Carbon 330 1/4W ±5%
R10	R2EDZJ563APA	Carbon 56k 1/4W ±5%
R11	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R14	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R15,16	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R17	R2EDZJ122APA	Carbon 1.2k 1/4W ±5%
R18	R2EDZJ822APA	Carbon 8.2k 1/4W ±5%
R19	R2EDZJ562APA	Carbon 5.6k 1/4W ±5%
R20	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R21	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R22	R2EDZJ123APA	Carbon 12k 1/4W ±5%
R24	R2EDZJ563APA	Carbon 56k 1/4W ±5%
R25	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R26	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R27	R2EDZJ470APA	Carbon 47 1/4W ±5%
R29,30	R2EDZJ392APA	Carbon 3.9k 1/4W ±5%
R31,32	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R33	R2EDZJ682APA	Carbon 6.8k 1/4W ±5%
R34	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R35	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R36	R2EDZJ333APA	Carbon 33k 1/4W ±5%
R37	R2EDZJ562APA	Carbon 5.6k 1/4W ±5%
R38	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R39	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R40	R2EDZJ151APA	Carbon 150 1/4W ±5%
R41	R2EDZJ221APA	Carbon 220 1/4W ±5%
R42	R2EDZJ152APA	Carbon 1.5k 1/4W ±5%
R43	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R45	R2EDZJ331APA	Carbon 330 1/4W ±5%

MUTING P.C.BOARD
(BOTTOM VIEW)


2
1
FM MUTING

POWER SUPPLY P.C.BOARD
(BOTTOM VIEW)


FUSE
400mA
SLOW-BLOW
4
5
6
7
C09
220/25
C04
0.01
D01
S1RBA20
C05
1000/25
C03
0.01
C02
0.01
C01
0.01
IC01
FS-7812
C08
470/16
C07
100/6.3
R01
270
1/2W
D02
RD9.1E
D03
4.7EB3
R02
82
1W
C06
100/16
1
2
3

PARTS LIST (Continued)

Ref. No.	Parts Number	Description			
	RESISTORS				
R46,47	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R48	R2EDZJ470APA	Carbon	47	1/4W	±5%
R49	R2EDZJ102APA	Carbon	1k	1/4W	±5%
R50	R2EDZJ332APA	Carbon	3.3k	1/4W	±5%
R51	R2EDZJ184APA	Carbon	180k	1/4W	±5%
R52	R2EDZJ563APA	Carbon	56k	1/4W	±5%
R53	R2EDZJ332APA	Carbon	3.3k	1/4W	±5%
R54	R2EDZJ152APA	Carbon	1.5k	1/4W	±5%
R55	R2EDZJ104APA	Carbon	100k	1/4W	±5%
R56	R2EDZJ102APA	Carbon	1k	1/4W	±5%
R57	R2EDZJ470APA	Carbon	47	1/4W	±5%
R58,59	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R60,61	R2EDZJ562APA	Carbon	5.6k	1/4W	±5%
R62,63	R2EDZJ104APA	Carbon	100k	1/4W	±5%
R64,65	R2EDZJ103APA	Carbon	10k	1/4W	±5%
R66,67	R2EDZJ152APA	Carbon	1.5k	1/4W	±5%
R68,69	R2EDZJ222APA	Carbon	2.2k	1/4W	±5%

MUTING P.C.B. Assy
131 0 4001 00431

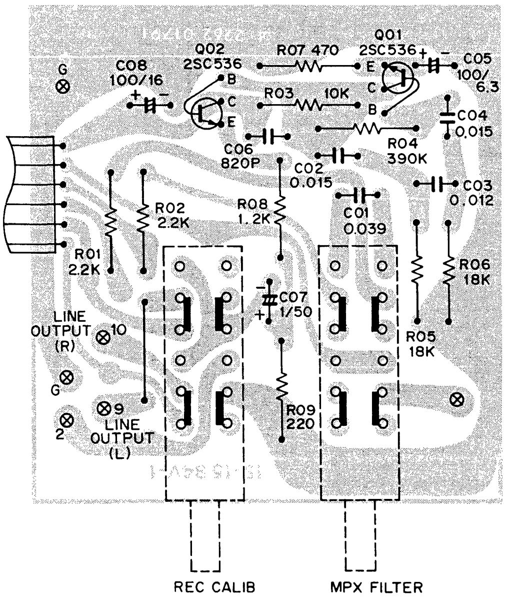
Ref. No.	Parts Number	Description
	4 2312 01200	Push Switch 1 Key

POWER SUPPLY P.C.B. Assy
131 0 4001 00452

Ref. No.	Parts Number	Description
	4 2349 20131	Fuse 400 mA
	4 2352 00200	Fuse Clip
	131 2 6201 21500	Plate Heat Sink
	131 2 6201 26100	Plate Heat Sink
	CAPACITORS	
C01,02 03,04	C2HYSP103A	Ceramic 0.01 μF 500V +100,–0%
C05	C1ERB-108A	Electrolytic 1000 μF 25V
C06	C1CRB-107A	Electrolytic 100 μF 16V
C07	C0JRY-107APA	Electrolytic 100 μF 6.3V
C08	C1CRB-477A	Electrolytic 470 μF 16V
C09	C1ERB-227A	Electrolytic 220 μF 25V
	SEMICONDUCTORS	
D01	DDD-S1RBA20	Bridge Diode, 1A S1RBA20
D02	DNN-RD9.1E	Diode, RD9.1E
D03	DNN-RD4.7EB3	Zener Diode, RD-4.7EB3
IC01	IAA-FS-7812M	IC Voltage Regulator FS-7812M
	RESISTORS	
R01	R3AXBJ271A	Oxide Metal Film 270 1W ±5%
R02	R3AXBJ820A	Oxide Metal Film 82 1W ±5%

OSC/HIGH BLEND P.C.BOARD

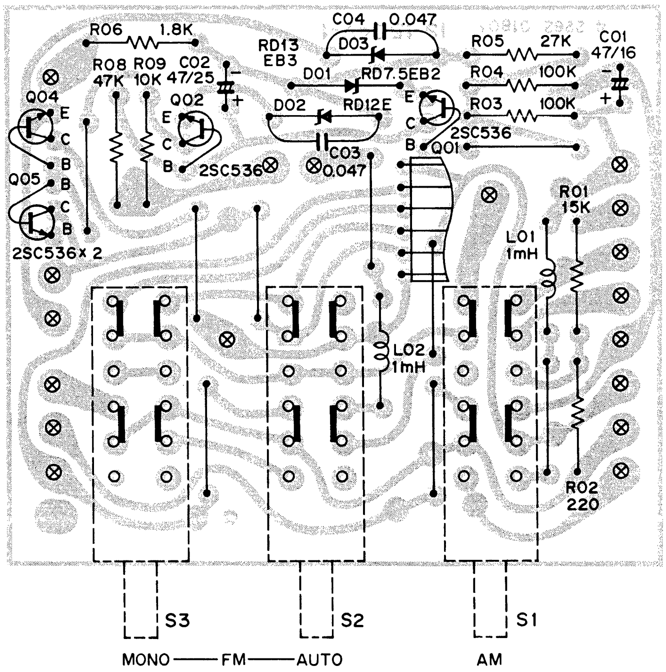
(BOTTOM VIEW)


G
C08
100/16
Q02
2SC536
R07 470
Q01
2SC536
C05
100/
6.3
R03
10K
C04
0.015
R04
390K
C06
820P
C02
0.015
C03
0.012
R02
2.2K
R08
1.2K
C01
0.039
R01
2.2K
R06
18K
C07
1/50
LINE
OUTPUT
(R)
10
R05
18K
G
9
LINE
OUTPUT
(L)
2
R09
220
REC CALIB
MPX FILTER

TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01	2SC536	1.0V	2.8V	0.4V
Q02	2SC536	2.8V	11.7V	2.0V

FUNCTION P.C.BOARD

(BOTTOM VIEW)


C04 0.047
R06 1.8K
RD13
EB3
D03
R05 27K
C01
47/16
R08 R09 C02
47K 10K 47/25
D01
RD7.5EB2
R04 100K
Q04
Q02
D02
RD12E
R03 100K
Q01
2SC536
C03
0.047
2SC536
Q05
2SC536×2
R01
15K
L01
1mH
L02
1mH
R02
220
S3
S2
S1
MONO——FM——AUTO
AM

TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01	2SC536	−6.8V	−1.3V	−6.7V
Q02	2SC536	−1.3V	−1.9V	−1.9V
Q03,04	2SC536	−1.9V	0V	0V

PARTS LIST (Continued)

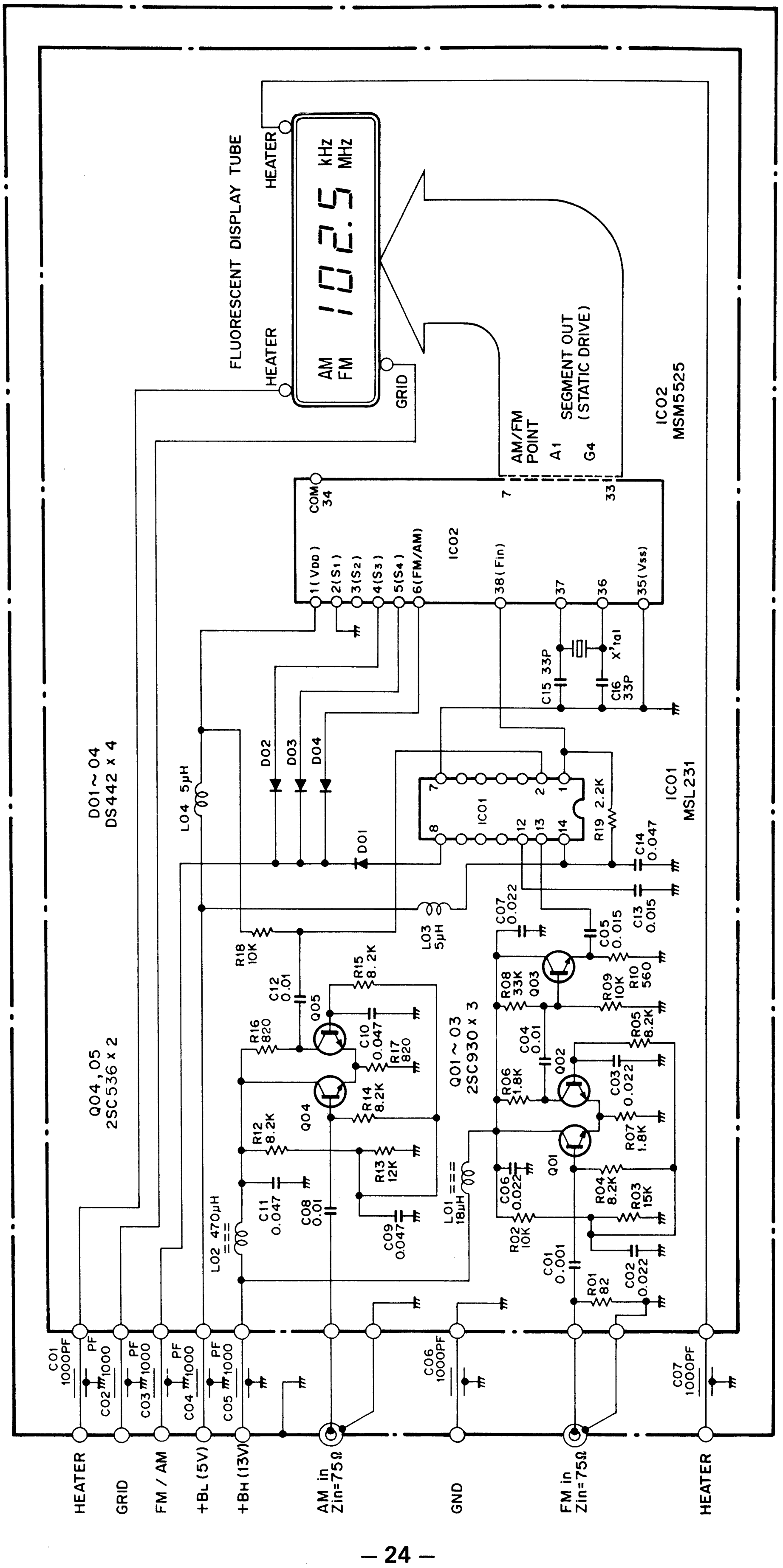
OSC/HIGH BLEND P.C.B. Assy
131 0 4001 00411

Ref. No.	Parts Number	Description
	4 2312 01210	Push Switch 2 Key
	CAPACITORS	
C01	C1HFAK393A	Mylar 0.039 μF 50V ±10%
C02	C1HFYK153APA	Mylar 0.015 μF 50V ±10%
C03	C1HFAK123A	Mylar 0.012 μF 50V ±10%
C04	C1HFAK153A	Mylar 0.015 μF 50V ±10%
C05	C0JRY-107APA	Electrolytic 100 μF 6.3V
C06	C1HYYK821APA	Ceramic 820 pF 50V ±10%
C07	C1HRY-105APA	Electrolytic 1 μF 50V
C08	C1CRB-107A	Electrolytic 100 μF 16V
	SEMICONDUCTORS	
Q01,02	203 5 5000 53660	TR 2SC536
	RESISTORS	
R01,02	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R03	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R04	R2EDZJ394APA	Carbon 390k 1/4W ±5%
R05,06	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R07	R2EDZJ471APA	Carbon 470 1/4W ±5%
R08	R2EDZJ122APA	Carbon 1.2k 1/4W ±5%
R09	R2EDZJ221APA	Carbon 220 1/4W ±5%

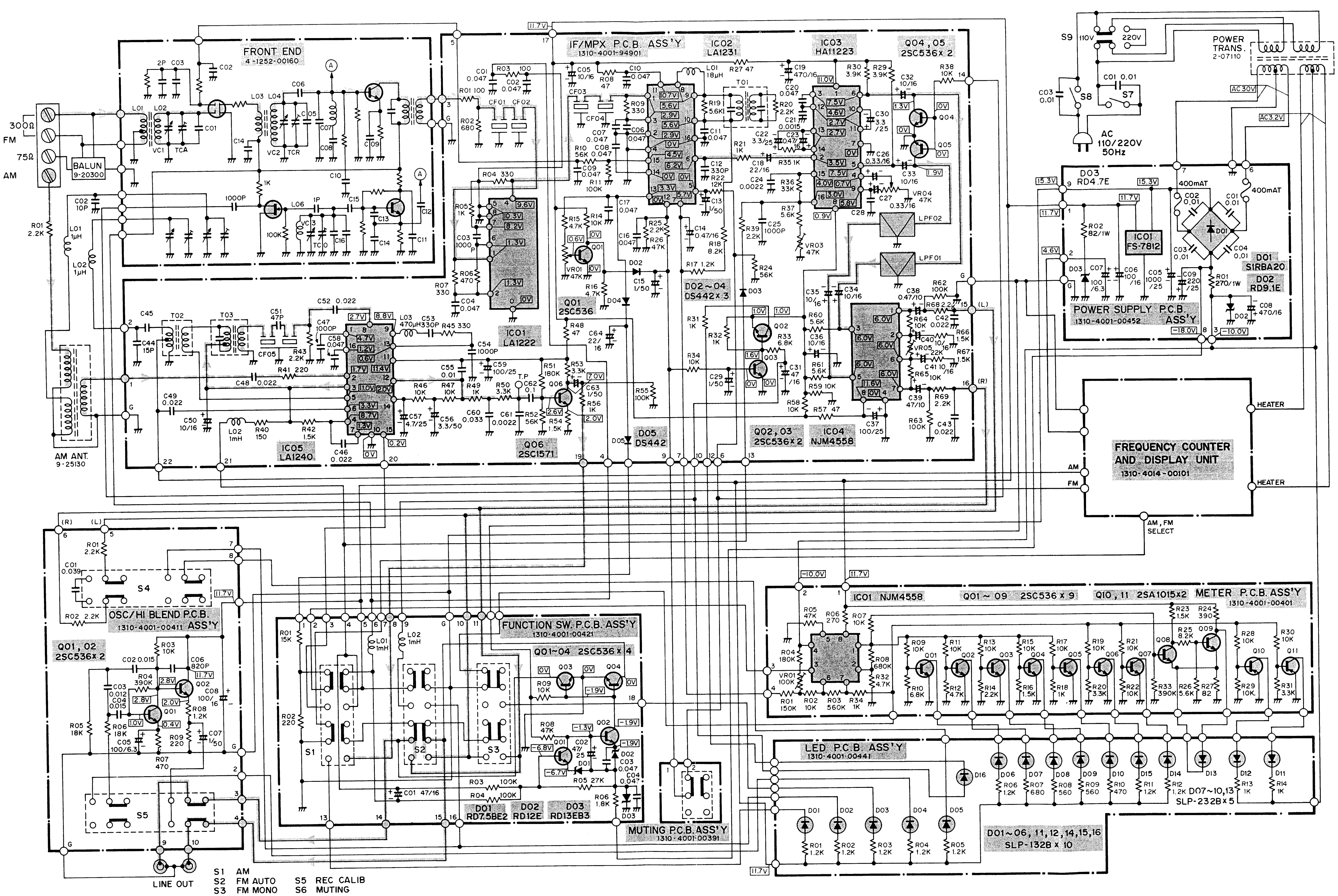
FUNCTION P.C.B. Assy
131 0 4001 00421

Ref. No.	Parts Number	Description
	4 2312 01220	Push Switch 3 Key
L01,02	4 2532 00040	Choke Coil 1 mH
	CAPACITORS	
C01	C1CRB-476A	Electrolytic 47 μF 16V
C02	C1ERB-476A	Electrolytic 47 μF 25V
C03,04	C1HYDZ473A	Ceramic 0.047 μF 50V +80,−20%
	SEMICONDUCTORS	
D01	DNN-RD7.5EB2	Diode, RD-7.5EB2
D02	DNN-RD12E	Diode, RD12 E
D03	DNN-RD13EB3	Diode, RD-13EB3
Q01,02 03,04	203 5 5000 53660	TR 2SC536
	RESISTORS	
R01	R2EDZJ153APA	Carbon 15k 1/4W ±5%
R02	R2EDZJ221APA	Carbon 220 1/4W ±5%
R03,04	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R05	R2EDZJ273APA	Carbon 27k 1/4W ±5%
R06	R2EDZJ182APA	Carbon 1.8k 1/4W ±5%
R08	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R09	R2EDZJ103APA	Carbon 10k 1/4W ±5%

FREQUENCY COUNTER SCHEMATIC DIAGRAM


FLUORESCENT DISPLAY TUBE
HEATER
HEATER
GRID
AM
FM
kHz
MHz
SEGMENT OUT
(STATIC DRIVE)
AM/FM
POINT
A1
G4
IC02
MSM5525
COM 34
7
33
1(VDD)
2(S1)
3(S2)
4(S3)
5(S4)
6(FM/AM)
38(Fin)
37
36
35(Vss)
C15 33P
C16 33P
X'tal
D01~04
DS442 x 4
D01
D02
D03
D04
L04 5μH
IC01
MSL231
R19 2.2K
C14 0.047
C13 0.015
L03 5μH
R18 10K
C12 0.01
R15 8.2K
C07 0.022
C05 0.015
R08 33K
Q03
R09 10K
R10 560
C04 0.01
Q04,05
2SC536 x 2
Q01~03
2SC930 x 3
R16 820
Q05
C10 0.047
R17 820
R06 1.8K
Q02
C03 0.022
R05 8.2K
R14 8.2K
Q04
R12 8.2K
R13 12K
Q01
R07 1.8K
C06 0.022
L01 18μH
R04 8.2K
R03 15K
C11 0.047
C08 0.01
C09 0.047
L02 470μH
R02 10K
C01 0.001
R01 82
C02 0.022
C01 1000PF
C02 1000 PF
C03 1000 PF
C04 1000 PF
C05 1000 PF
C06 1000PF
C07 1000PF
HEATER
GRID
FM / AM
+BL (5V)
+BH (13V)
AM in Zin=75Ω
GND
FM in Zin=75Ω
HEATER

SCHEMATIC DIAGRAM


FRONT END 4-1252-00160
IF/MPX P.C.B. ASS'Y 1310-4001-94901
IC01 LA1222
IC02 LA1231
IC03 HA11223
IC04 NJM4558
IC05 LA1240
Q01 2SC536
Q02, 03 2SC536x2
Q04, 05 2SC536x2
Q06 2SC1571
D02~04 DS442x3
D05 DS442
POWER TRANS. 2-07110
POWER SUPPLY P.C.B. ASS'Y 1310-4001-00452
IC01 FS-7812
D01 S1RBA20
D02 RD9.1E
D03 RD4.7E
AC 110/220V 50Hz
S9 110V 220V
FREQUENCY COUNTER AND DISPLAY UNIT 1310-4014-00101
HEATER
AM, FM SELECT
300Ω FM
75Ω
AM
BALUN 9-20300
AM ANT. 9-25130
OSC/HI BLEND P.C.B. ASS'Y 1310-4001-00411
Q01, 02 2SC536x2
S4
S5
LINE OUT
FUNCTION SW. P.C.B. ASS'Y 1310-4001-00421
Q01~04 2SC536x4
D01 RD7.5BE2
D02 RD12E
D03 RD13EB3
S1
S2
S3
MUTING P.C.B. ASS'Y 1310-4001-00391
IC01 NJM4558
Q01~09 2SC536x9
Q10, 11 2SA1015x2
METER P.C.B. ASS'Y 1310-4001-00401
LED P.C.B. ASS'Y 1310-4001-00441
D07~10, 13 SLP-232Bx5
D01~06, 11, 12, 14, 15, 16 SLP-132Bx10

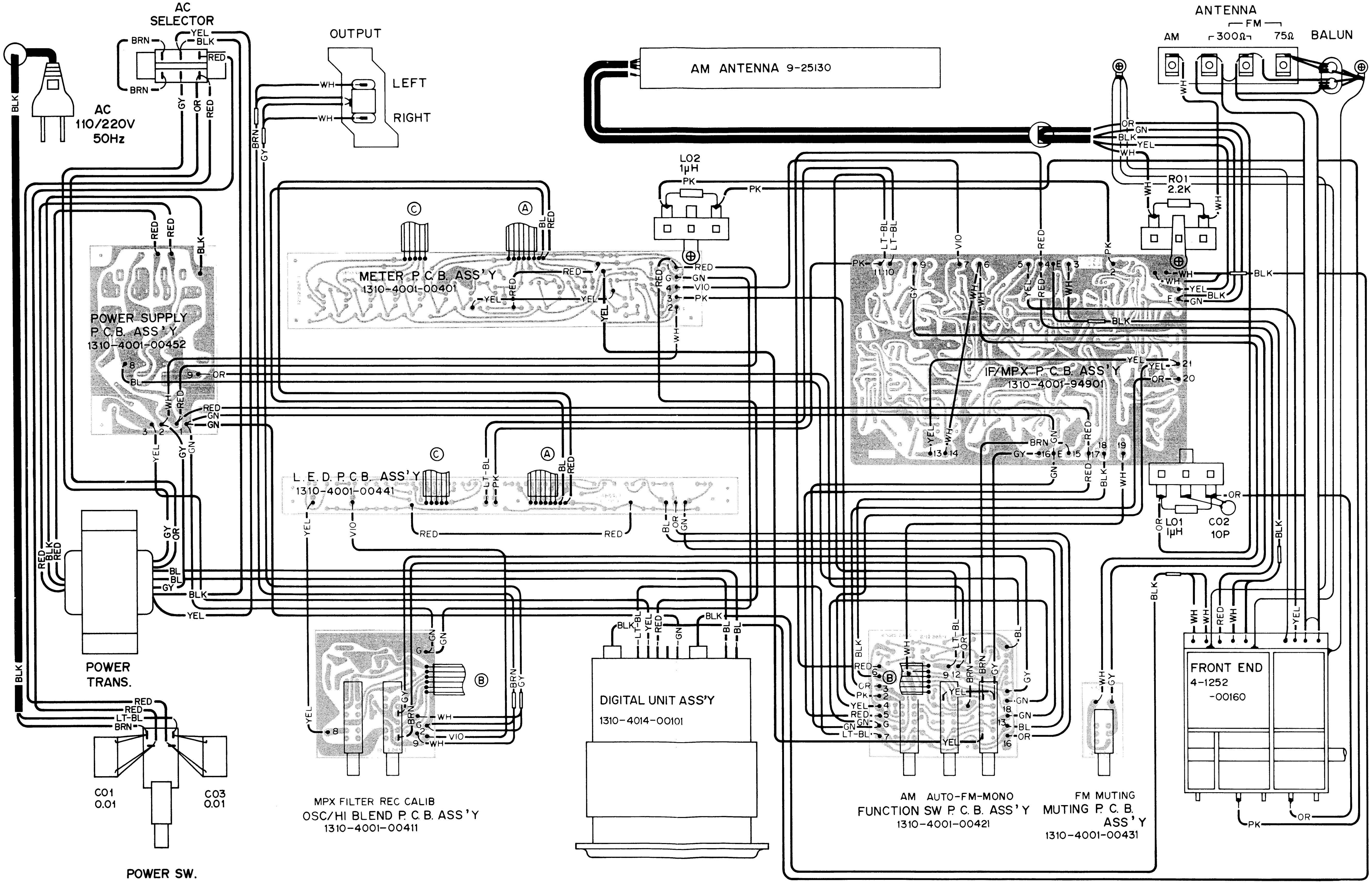
S1 AM
S2 FM AUTO
S3 FM MONO
S4 HI BLEND
S5 REC CALIB
S6 MUTING
S7,8 POWER SW.
S9 VOLTAGE SELECTOR

NOTES:

1. All resistors values are indicated in "ohm" (K=10^3, M=10^6).
2. All capacitors values are indicated in "μF" (P=10^{-12}).
3. All volatages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10% with respect chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50 Hz
4. This is a fundamental schematics diagram. Some products may be modified without notice.

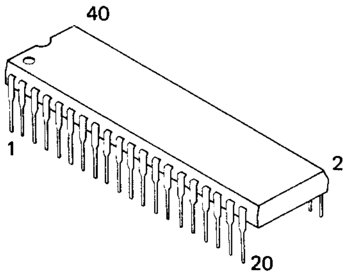
POINT TO POINT WIRING DIAGRAM

FM-2321(SEV)
WIARING DIAGRAM

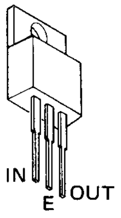

AC SELECTOR
AC 110/220V 50Hz
OUTPUT
LEFT
RIGHT
AM ANTENNA 9-25130
ANTENNA
AM
FM
300Ω
75Ω
BALUN
L02 1μH
R01 2.2K
METER P.C.B. ASS'Y 1310-4001-00401
POWER SUPPLY P.C.B. ASS'Y 1310-4001-00452
IF/MPX P.C.B. ASS'Y 1310-4001-94901
L.E.D. P.C.B. ASS'Y 1310-4001-00441
LO1 1μH
CO2 10P
POWER TRANS.
DIGITAL UNIT ASS'Y 1310-4014-00101
FRONT END 4-1252 -00160
CO1 0.01
CO3 0.01
POWER SW.
MPX FILTER REC CALIB
OSC/HI BLEND P.C.B. ASS'Y 1310-4001-00411
AM AUTO-FM-MONO
FUNCTION SW P.C.B. ASS'Y 1310-4001-00421
FM MUTING
MUTING P.C.B. ASS'Y 1310-4001-00431
Ⓐ
Ⓑ
Ⓒ
BLK
BRN
YEL
RED
GY
OR
GN
BL
LT-BL
WH
PK
VIO

SEMICONDUCTOR LEAD IDENTIFICATION

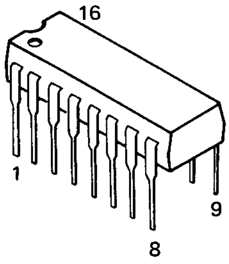
INTEGRATED CIRCUITS



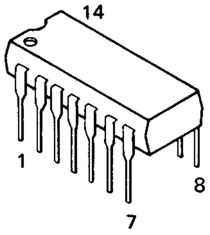
- MSM-5525



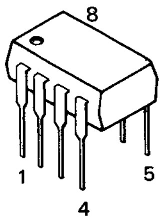
- FS-7812M



- LA1231
- LA1240
- HA-11223

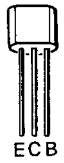


- MSL-2318



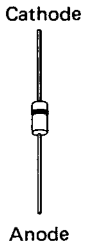
- NJM4558
- LA1222

TRANSISTORS

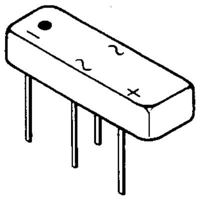


- 2SC930
- 2SC536
- 2SC1571

DIODES


Cathode
Anode

- DS-442
- RD9.1E
- RD12E
- RD-4.7EB3
- RD-7.5EB2
- RD-13EB3



- S1RBA20